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ADOLF MEYER

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BOSTON

The son of a Swiss Zwinglian minister, Adolf Meyer was born in Niederweningen, Switzerland, near Zurich, on Sept. 13, 1866. After receiving a solid Swiss education he was faced with the problem of the choice of a profession. In weighing the relative opportunities offered by the church and by medicine, he decided in favor of the latter as offering closer touch with the fulness of individual human life.

He completed his medical studies at Zurich and passed the qualifying state examination in 1890. Two years of fruitful postgraduate study abroad followed. He made contact with the leaders in French medicine and especially with the Déjerines. In Edinburgh he learned to know Francis Caird, Byrom Bramwell and John Wyllie. In London he met the brilliant group of neurologists associated with the Queen Square Hospital. The work of Gowers on the spinal cord made a deep impression on him, but his thought was specially molded by the formulations of Hughlings Jackson and of Huxley. While enriching his clinical and anatomic experience, he sought some framework of thought within which he could assimilate the divergent views of philosophers, biologists and physicians as to the place of human experience in a world from which scientists seemed to have banished thought and value.

Interest in the anatomy of the brain led to a doctoral thesis on the structure of the forebrain of reptiles.

At first Meyer looked forward to a career in comparative neurology and rejected psychiatry as a discipline requiring too much facility in verbal expression.

In 1892 he sailed for the United States and took up residence in Chicago, where one of his earliest purchases was a piano, a source of much comfort. To meet the more practical demands of life, in 1893 he became pathologist at the Illinois Eastern Hospital at Kankakee, Ill. As pathologist he did not limit himself to morphologic studies but emphasized the necessity of sound clinical observations: "Without this clinical accuracy pathological anatomy remains a science of the dead." His interest in the concrete problems of the living person and in the

difficulties of human adaptation were shown by contemporary communications dealing with the abnormalities of children and the necessity of their systematic study.

In 1893, as docent in neurology at the University of Chicago, he conducted an elective course in the comparative anatomy of the nervous system, and in 1895 he gave the regular course in the anatomy of the brain.

In 1895 Meyer left Kankakee because the superintendent, while accepting his plans for the development of scientific and clinical work in the hospital, did not see fit to give him the degree of participation in the work which he considered necessary. His position in Kankakee had been not without its piquant situations and episodes, and Meyer had gained some insight into the complexities and uncertainties of a scientific career in America.

He left Kankakee in order to take advantage of the fuller opportunities which were placed at his disposal in the Worcester State Hospital (Massachusetts), where he was first appointed as pathologist and later given additional responsibility as clinical director.

During the eight years which he spent at the Worcester State Hospital Meyer carried on studies in the pathology and anatomy of the brain. He reviewed in a critical and penetrating way the psychiatric doctrines of the leading exponents of German psychiatry. He began to work out, on the basis of his own clinical material and with a comprehensive point of view which did justice to all the facts, an orderly system in which he could group the real material of the psychiatrist's experience, with its varied aspects.

While doing justice to such work as that of Cowles, at the McLean Hospital, Belmont, Mass., and of Van Gieson, in his new Pathological Institute in New York, Meyer emphasized that clinical study must be the basis of all rational pathology. In order that the clinical study of mental patients should be systematic and comprehensive, he outlined a method of case taking which later became the standard method not only in the New York state hospitals but throughout the country. This "Guide for History-Taking" was edited by Dr. George H. Kirby in 1921 and by Dr. Clarence O. Cheney in 1934.

As clinical director at the Worcester State Hospital Meyer had the task of directing the clinical work of the staff physicians, of training the junior members of the staff and of directing research. During this period he had under him a number of assistants who were later to make their mark in the field of psychiatry—George M. Kline, Albert M. Barrett, Henry A. Cotton, George H. Kirby, Charles B. Dunlap, Isador H. Coriat and Peter Bassoe.

In addition to his work with the staff of the hospital, he gave instruction in psychology to graduate students in psychology at Clark Univer-



sity. He was interested in the studies of child psychology and child development which were being carried on by Stanley Hall and his pupils.

During this period Meyer was accumulating clinical observations, not only studying the clinical pictures with their different symptomatology but trying to penetrate to the underlying forces which determined the individual destiny of his patients, scrutinizing carefully the past to see what influences might have been modified and studying the present to see where the physician might step in with advantage to the patient. The point of view thus gained during this period was formulated within a year after leaving the Worcester State Hospital in a paper entitled "An Attempt at Analysis of the Neurotic Constitution."

With his broad grasp of the possibilities and responsibilities within the field of psychiatry, Meyer developed a program which he saw himself unable to carry out at Worcester, owing to certain administrative objections raised by the superior authorities. In 1901 he decided, with regret, to leave the Worcester State Hospital for the broader field offered him in New York, where greater freedom of action was promised. In 1902 he was appointed to the directorship of the Pathological Institute of the New York State Hospitals for the Insane, from which Van Gieson had resigned. Van Gieson had established the institute in New York City, where he had proposed to coordinate various sciences in the attempt to give psychiatry what he considered a scientific basis. The aim of Van Gieson was not so dissimilar to what may frequently be seen today, where the attempt to make psychiatry scientific is likely to result in the disappearance of psychiatry from the program.

As Meyer realized that an institute which has to deal with the problems of mental disorders ought to be in close contact with a hospital for the treatment of such diseases, he transferred the Pathological Institute to Ward's Island, where the rich clinical material of the Manhattan State Hospital would be available. A converted bakeshop became his workshop for the next few years, its modest accommodation contrasting with the palatial equipment of contemporary medical institutes. A special service for women patients was allotted to the institute by the superintendent of the Manhattan State Hospital, and later a male ward was added to the clinical facilities.

The program for the next seven years consisted of (1) continued investigation into the nature of mental disorders, including their causes, clinical manifestations, course, treatment and prevention, and into the normal and pathologic anatomy of the brain; (2) the organization and maintenance of a high standard of clinical and laboratory work throughout the state hospitals by personal visits and hospital conferences; (3) courses of intensive instruction given to groups of assistant physicians from the state hospitals; (4) teaching medical students of the Cornell University Medical College; (5) cooperation with various

medicosocial and medicopedagogic organizations which could benefit by the special methods and results of the psychiatrist, and (6) presentation of communications to a variety of local and national associations and the publication in medical journals of a series of papers which represented the various trends of his activity.

From the first, Meyer laid great emphasis on case taking and the necessity of systematic and detailed records. His guide to history taking involved a change of outlook and habits of physicians who had been brought up in a different school. It needed a certain force of personality to see that the use of this outline became a matter of routine with all physicians in the state service. New methods and new doctrines are not always welcomed with eagerness, and the introduction by Meyer of new methods and attitudes into the New York state hospital system was not an affair of passive spreading and effortless diffusion but demanded protracted effort, tact and patience. The new methods and attitudes were not confined to clinical observation but were extended to work in the autopsy room and the laboratory.

The work in the pathologic laboratory of the Pathological Institute (later called the Psychiatric Institute) on Ward's Island was placed in the charge of Dr. Charles B. Dunlap, who brought a finished technic and an extremely critical mind to his investigations of the morphologic changes in various mental disorders.

Meyer continued his studies in the anatomy of the brain and on the course of pathways as revealed by secondary degeneration and the light thrown by gross injuries on clinical problems, especially those of aphasia, which were arousing much interest and discussion. A valuable collection of brain sections with focal lesions was accumulated, and Meyer, by means of drawings on glass slides, produced valuable tridimensional reconstructions of focal damage to the brain and its secondary consequences. This material was utilized in the courses given to the groups of physicians who were sent to the Pathological Institute from the state hospitals for special instruction.

Instruction was not limited to the hospital physicians and graduates, for in 1904 Meyer was appointed professor of psychiatry at the Cornell University Medical College and was faced with the problem of giving systematic clinical instruction to undergraduate students. In his instruction Meyer avoided the schematic, the verbal and the general. He encouraged the student to observe, to record and to experiment, if possible. Above all, he showed a profound respect for the facts, and when he was presented by the student with an inconclusive outline of a case, his demand was not for a more ingenious interpretation but for ever more facts until a convincing picture of the development of the disorder was available.

The clinical service in the Manhattan State Hospital offered rich material for the study of the psychoses in general. It was in this service that visiting assistant physicians did their clinical work, which formed the basis of profitable discussions.

The seven years in New York City were years of continuous productivity and development, which embraced the work of the physician in the state hospitals, the training of the undergraduate and the graduate in the field of psychiatry, the increase of knowledge in regard to the structure and function of the brain and the utilization by social agencies of the help which psychiatry can afford.

In September 1902 Meyer married Mary P. Brooks, of Newburgh, N. Y., and in his wife found one able to enter into his aspirations and eager to help in their realization. His interest in human beings and in dealing with their actual life difficulties, which led him to be impatient with verbal and schematic nosologic discussions, made him eager to get a more complete and living picture of the every-day life of his patients in their natural environment and to help the patient and the family to realize that the physician is not dealing with occult or sterile procedures but is trying to offer real help in practical difficulties. Mrs. Meyer visited patients and relatives in their homes on the East Side of New York and thus blazed the trail for the psychiatric social worker, at that time unknown. In 1906 Meyer was able to guide a well meaning but rather patronizing effort at after-care toward the establishment of a more wholesome type of medicosocial contact, and the first psychiatric social worker was appointed at the Manhattan State Hospital.

In 1910, when Mr. Henry Phipps made his munificent donation for a psychiatric clinic to the Johns Hopkins Hospital, Meyer was the obvious choice for the director of this new institution. He accepted the position, not without regret over the interruption of the New York developments. The Henry Phipps Psychiatric Clinic was not opened until 1913. The three intervening years involved much preparatory work. European clinics were visited; careful consideration was given to the structure and functions of the future clinic; the personnel had to be chosen and the organization outlined.

During this period it was possible to continue clinical work in the outpatient department of the Johns Hopkins Hospital and to carry on studies in the anatomy of the brain. Meyer delivered his Harvey lecture on "The Present Status of Aphasia and Apraxia" in March 1910. He accepted an invitation to make a survey of the condition of the state hospitals in Massachusetts in 1911, and in February 1912 he presented the results of the survey to the responsible authorities. In the report he not only gave the factual results of his personal survey but analyzed the functions of a state hospital in general and discussed

the general needs of the community and the coordination of the available resources.

With the opening of the Phipps Clinic in 1913 Meyer settled down to the internal organization of the work in the clinic, the coordination of the work in the clinic with that in the general hospital and with the teaching in the medical school and the establishment of sound relations with the various agencies in the community dealing with problems of human welfare.

The psychologic laboratory in the new clinic was utilized by Prof. J. B. Watson for his experimental work in conditioning infants. Lashley, too, carried on work in this laboratory. At the request of Meyer, Professor Watson and Prof. Knight Dunlap participated in a course in psychology which was a preparation of the medical student for his clinical studies. The laboratory of internal medicine cooperated actively with the clinical staff and supplemented the bedside studies of the patient, while it offered opportunities for carrying on special investigations on the biochemical problems presented by psychiatric patients. In the anatomic laboratory Meyer continued to carry on his pathologic investigations and to add to his remarkable collection of sections and models of the brain.

The new clinic offered admirable facilities for carrying out thorough clinical work with a selected group of patients. With an adequate clinical staff and accessory personnel, the nurses being supplied by the Johns Hopkins Hospital, it was possible to make an unusually thorough study of the individual patient, to formulate the case with due respect to the complexity of the individual life and to outline a program for the satisfactory treatment and care of the patient in the clinic and after his return to the community. An exceptional opportunity was thus offered to the house physicians in the clinic, and the medical student was in close contact with clinical work carried on at an unusual level.

The period from the opening of the clinic in 1913 to the present year, 1937, has been one of continuous development and productivity along the various lines referred to. Meyer continued his researches in the anatomy of the brain and the pathologic changes in mental disorders. He continued his clinical investigations and developed his formulations with regard to mental disorders in general. He made contributions to important social discussions and movements. He devoted himself seriously to the problem of undergraduate and graduate education in psychiatry. He encouraged the formulation of cases in terms that did justice to the concrete facts and that could be utilized by the physician, nurse or relative responsible for the patient. In various communications and addresses this emphasis on the concrete, the intelligible and the helpful was the outstanding note.

The Phipps Clinic from the beginning exerted a striking influence on the general hospital of which it is an integral part. Psychiatric attitudes and concepts began to replace a somewhat detached or mildly condescending attitude towards psychiatric problems and investigations. The close cooperation between the clinic and other departments of the hospital is illustrated by the later delegation of Dr. Leo Kanner to work in the department of pediatrics, to which he made an outstanding contribution.

It was a disappointment to Meyer that on the establishment of the School of Public Health at the Johns Hopkins University in 1919 his suggestion for a department of mental hygiene was not accepted.

From the beginning of the clinic Meyer devoted himself with increasing zeal to the teaching of the medical student. With his marked anatomic interest, he organized a course in the anatomy of the brain in which the student had to carry out a reconstruction of the central nervous system and work with actual sections and photographs instead of with diagrams and schemata. Work of this nature served as an extremely useful introduction of the student to the Phipps Psychiatric Clinic. The methods which Meyer employed were elaborated and systematized, and the results were published in collaboration with Dr. Louis Hausman. With regard to the training of the medical student in psychiatry, Meyer gradually elaborated his procedure and discussed it in various communications. The student was stimulated in his first year to take an interest in the organization of the human personality and to study in some detail the nature of the forces that made up his own personality. In the second year methods of case taking and certain familiar types of reaction were demonstrated. In the following two years the student had close contact with clinical material and obtained first hand experience in dealing with practical problems.

When the National Committee for Mental Hygiene established a department of psychiatric education with an advisory committee, Meyer was appointed chairman of this committee and had much to do with the direction of the three conferences on psychiatric education which were held under the auspices of the division.

While carrying on his anatomic and clinical studies and devoting much thought to the problems of medical education, Meyer continued to make his experience and judgment available to those who were dealing with important social questions. In various communications he discussed the right to marry, sex education, eugenics, birth control, character education, the meaning of maturity and spontaneity.

In addition to the work involved in the special responsibilities of his successive positions, Meyer associated himself actively with national and local societies, both those of strictly professional nature and those which had a wider social reference. He was especially active in the



American Psychiatric Association and the American Neurological Association, in both of which he was elected president. During the organization of the National Committee for Mental Hygiene (1909) he was of great value to Mr. Clifford Beers, and during its subsequent career he has been a valued counselor. As the accredited representative of American psychiatry, Meyer has been called on for advice by governmental agencies, universities, social and educational agencies and countless individuals. Recognition has not been confined to the United States, and his teaching has had a considerable influence on European psychiatry. He has received academic honors from various universities (LL.D., Glasgow, 1901; LL.D., Clark, 1909; D.Sc., Yale, 1934) and has been elected corresponding member of many foreign societies.

The influence of Meyer, directly exerted by his personality and his example on his colleagues and pupils, was widely spread through his various publications. In these publications he announced the results of specific pieces of investigation and outlined the developing stages of his thought with regard to some of the fundamental problems of psychiatry and its allied fields.

Of his communications on the structure of the normal and the abnormal brain, one may specially cite his papers on the parenchymatous systemic degenerations ("central neuritis"), the course of the optic radiations, aphasia and apraxia and a method of teaching the anatomy of the brain.

In the evolution of Meyer's thought on the problems of mental disorders there were an early discarding of the formal and scholastic and an obstinate determination to respect facts no matter how difficult it might be to fit them into any scheme. The material of a psychiatrist is not a series of mental disorders but a group of disordered persons who either are themselves in distress or are causing distress or perplexity to others. Meyer took these disordered patients as an intellectual challenge and tried by a detailed study of the past development to make the actual situation more intelligible. He joined issue with those who discredited such activity on the basis of artificial divisions and abstract formulations. The physician who deals with the human organism under abstract categories, who thinks merely in terms of biochemical processes or reflexes or of toxic or structural modifications, has no guarantee that these categories will be adequate for the problem with which he has to deal, a problem which involves the fulness of the individual life.

In many articles Meyer emphasized the necessity of doing justice to the complexity of human nature and the danger of the abstract formulation of human life in exclusive terms either of physiologic or of psychologic nature.

The basis of the physician's approach to a problem in internal medicine is his knowledge of the underlying physiologic processes of the

individual systems and their coordination, and the basis of his approach to the disorders of the human personality must be an analogous knowledge of the psychologic laws underlying the behavior of the individual patient in reaction to the environment. To emphasize the concrete nature of the study, the absence of any false abstraction and the respect for facts of human behavior and thought, Meyer used the term *psychobiology* instead of *psychology*.

Impressed with the advance of Kraepelin over the schematic presentation of Ziehen and the neurologic outlook of Wernicke, Meyer utilized the broad kraepelinian classification. He soon realized the limitations of classification and saw that it was much more important to keep to the facts of life than to classify. His detailed observation of patients belonging to the kraepelinian group of *dementia praecox* led him to discard the formulation of Kraepelin, who saw a disease crouching beneath certain surface symptoms. Meyer saw in these patients persons who had failed to meet the tests of life, and he patiently attempted to survey the evolution of these patients, in order that he might reconstruct the steps of their development and do justice to all the variables which entered into the situation. In this review he emphasized the original endowment of the patient, the special traits of personality, the molding influences of the home, the formation of habits, the stresses of the actual situation and the presence of bodily ailments. He considered the symptoms not in isolation but in the setting of the patient's behavior in his actual life situation. His paper on "Fundamental Concepts in *Dementia Praecox*" (1906), an important milestone in the history of psychiatry, excited comparatively little comment at the time, but the views presented in this paper and in subsequent papers slowly permeated the whole of modern psychiatric thought.

The point of view which came so clearly to expression in these communications dominated the whole of his work. This point of view meant a recognition of the many variables that enter into mental disorders—among others, of the environmental factors which contribute to mental disorders and which ought to be considered in relation to prophylaxis. Thus the detailed study of his individual cases led him to look into the structure of the home and the organization of the school and of social life. It enabled him to make important pronouncements on these practical matters on the basis not of theoretical considerations but of a factual material which had been carefully scrutinized.

In dealing with the problem of mental disorders as a public health problem, the grasp of this factual material enabled him to see the patients living in their special environments, mixing with their fellows and carrying on their vocations. The question of mental hygiene took

in his mind immediately a concrete and practical form. He thought in terms of medical and social organizations helping actual persons in their real difficulties, bringing assistance to the homes, instructing parents and teachers, offering outlets for the exercise of native skills and endowment and promoting social relationships in a wholesome way. A task of society and of the medical profession was to organize the work of the latter, so that in the hospitals patients with the more serious conditions would receive at an early stage complete examination and suitable treatment, while there would radiate throughout the community under the direction of the hospitals various local agencies of helpful nature.

In his teaching of the medical student and of the graduate, along with marked emphasis on the necessity of a sound basic medical training and of accurate, precise and methodical case taking, with scrupulous regard to the facts, the student was always reminded that in psychiatry he was dealing with a human personality at grips with its environment and that the analysis of this individual human personality is the specific task of psychiatric work. In some cases mental symptoms may be more or less incidental, but in most instances the analysis of the personality is the center of the problem.

It is not necessary to adorn with words of praise the record which has been outlined here. The record speaks for itself. It is one of untiring devotion to a high social and scientific ideal and of the consistent and fruitful development of conceptions already grasped at an early age. The structural interests and investigations are in the setting of interest in the human personality, and the human personality is seen on the background of a philosophy of life in which human purpose and human responsibility are central conceptions.

To some workers with fruitful conceptions fortune refuses aid for their development. To some earnest and productive workers recognition by their fellows is denied during their lifetime. The maturing of Meyer's conceptions was contemporary with the development of broadening medical opportunities, so that he found at hand a suitable apparatus for the development and realization of his views and projects. The efforts which were at first necessary to overcome inertia and resistance could later be expended in more profitable directions, and the fruitful nature of his formulations and the value of activity based on these formulations commanded increasing attention and exerted an ever widening influence.

At 70 years of age Meyer can look back on a lifetime of productive activity, during which he has made important contributions to his chosen field of medical work, given powerful aid to valuable social activities and won the affection and admiration not only of his pupils and colleagues but of the leaders in movements for social progress.

## BIBLIOGRAPHY OF ADOLF MEYER

- Medizinische Studien in Paris, Edinburg und London, Cor.-Bl. f. schweiz. Aerzte, 1891, vol. 21.
- Ueber das Vorderhirn einiger Reptilien, Inaug. Dissert., 1892, pp. 1-73; Ztschr. f. wissensch. Zool., 1892, vol. 55, no. 1.
- Neurologists and Neurological Laboratories: II-IV. Neurological Work at Zurich, J. Comp. Neurol. **3**:1-6, 41-44 and 114-118, 1893.
- Preparations for a Post-Mortem Examination, Chicago Clin. Rev. **2**:32-36, 1893.
- On Preserving Embryological Material, J. A. M. A. **22**:251 (Feb. 24) 1894.
- How Can We Prepare Neurological Material to the Best Advantage? J. Nerv. & Ment. Dis. **21**:277-291, 1894.
- Report to the Governor of Illinois Concerning the "Treatment of the Insane," Springfield, Ill., Aug. 2, 1894, pp. 18-28.
- Considerations on the Findings in the Spinal Cord of Three General Paralytics, Am. J. Insanity **51**:374-379, 1894-1895.
- Zur Homologie der Fornixcommissur und des Septum lucidum bei dem Reptilien und Säugern, Anat. Anz. **10**:474-482, 1894-1895.
- Mental Abnormalities in Children During Primary Education, Tr. Illinois Soc. Child-Study, 1895, pp. 48-58.
- Schedule for the Study of Mental Abnormalities in Children, Hand-Book Illinois Soc. Child-Study, 1895, pp. 53-57.
- On the Observation of Abnormalities of Children, Child-Study Monthly **1**:1-12, 1895.
- A Few Demonstrations of the Pathology of the Brain and Remarks on the Problems Connected with Them, Am. J. Insanity **52**:242-249, 1895-1896; Proc. Am. Med.-Psychol. A. **2**:192-198, 1896.
- A Review of the Signs of Degeneration and of Methods of Registration, Am. J. Insanity **52**:344-363, 1895-1896.
- Psychiatrie: Ein Lehrbuch für Studierende und Aerzte by E. Kraepelin, book review, Am. J. Insanity **53**:298-302, 1896-1897.
- Etiological, Clinical, and Pathological Factors in Diagnosis and Rational Classification of Infectious, Toxic and Asthenic Diseases of the Peripheral Nerves, Spinal Cord and Brain, Medicine **2**:639-652, 1896.
- Pathological Report of the Eastern Illinois Hospital for the Insane: May 1, 1893-July 1, 1895, Chicago, 1896.
- A Case of Landry's Paralysis with Autopsy (in collaboration with Dr. T. Diller), Am. J. M. Sc. **111**:404-413, 1896.
- General Paralysis and Other Nervous and Mental Affections Following Syphilitic Infection, Yale M. J. **3**:311-317, 1896-1897.
- A Short Sketch of the Problems of Psychiatry, Am. J. Insanity **53**:538-549, 1897.
- The Morbid Anatomy of a Case of Hereditary Ataxy, Brain **20**:276-289, 1897.
- Anatomical Findings in a Case of Facial Paralysis of Ten Days' Duration in a General Paralytic with Remarks on the Termination of the Auditory Nerves, J. Exper. Med. **2**:607-610, 1897.
- Demonstration of Various Types of Changes in the Giant Cells of the Paracentral Lobules, Am. J. Insanity **54**:221-226, 1897-1898.
- Critical Review of the Data and General Methods and Deductions of Modern Neurology, J. Comp. Neurol. **8**:113-148 and 249-313, 1898-1899.

- Psycho-Pathology, in Clark University, 1889-1899, Decennial Celebration, Worcester, Mass., 1899, pp. 144-147.
- Tenth Anniversary of Clark University, *Am. J. Insanity* **56**:181-183, 1899-1900.
- Critical Review of Recent Publications of Bethe and Nissl, *J. Comp. Neurol.* **9**:38-45, 1899-1900.
- Reconstruction of Serial Sections of Brain, *J. Nerv. & Ment. Dis.* **27**:600, 1900.
- On Parenchymatous Systemic Degenerations, Mainly in the Central Nervous System, *Brain* **24**:47-115, 1901.
- Report of a Transverse Lesion of the Mid-Thoracic Segments Leaving Intact the Posterior Columns and Causing Syringomyelic Dissociation, *J. Nerv. & Ment. Dis.* **29**:715-721, 1902.
- A Few Remarks Concerning the Organization of the Medical Work in Large Hospitals for the Insane, Ward's Island, N. Y., 1902.
- Insanity: General Pathology, in Buck, A. H.: Reference Handbook of Medical Sciences, New York, William Wood & Company, 1902, vol. 5, pp. 36-43.
- Aims and Plans of the Pathological Institute of the New York State Hospitals, Ward's Island, N. Y., December 1902.
- On Some Terminal Diseases in Melancholia, *Am. J. Insanity* **59**:83-89, 1902-1903.
- Arrest of Development in Adolescence, *Proc. Nat. Educ. A.*, 1903, pp. 813-815.
- Arterio-Sclerosis and Mental Disease, *Albany M. Ann.* **24**:151-157, 1903; *Tr. M. Soc. New York*, 1903, pp. 109-114.
- A Review of Recent Problems of Psychiatry, in Church, A., and Peterson, F.: Nervous and Mental Diseases, ed. 4, Philadelphia, W. B. Saunders Company, 1903, pp. 650-688.
- Escape of Cerebrospinal Fluid Through the Nose, *J. Nerv. & Ment. Dis.* **30**:216, 1903.
- On the Pathology of Epilepsy, *M. News* **83**:108-112, 1903.
- An Attempt at Analysis of the Neurotic Constitution, *Am. J. Psychol.* **14**:354-367, 1903.
- Reports of the Pathological Institute of the New York State Hospitals for the Years 1903, 1904, 1905, 1906, 1907, 1908, Utica, N. Y.
- The Anatomical Facts and Clinical Varieties of Traumatic Insanity, *Am. J. Insanity* **60**:373-441, 1903-1904.
- A Few Trends in Modern Psychiatry, *Psychol. Bull.* **1**:217-240, 1904.
- Recent Literature in Neurology and Psychiatry, *Psychol. Bull.* **1**:258-290, 1904.
- Recent Literature on Normal and Abnormal Association, *Psychol. Bull.* **2**:242-258, 1905.
- A Discussion on the Classification of the Melancholias (with C. L. Dana, A. Starr and others), *J. Nerv. & Ment. Dis.* **32**:112-118, 1905.
- Adenoma of the Pineal Gland, Occluding the Aqueduct of Sylvius, with Escape of Cerebro-Spinal Fluid Through the Nose and Perforation of the Frontal Horn of the Right Lateral Ventricle, *J. Nerv. & Ment. Dis.* **32**:464-465, 1905.
- Diffuse Cauliflower-Like Puckering of the Cortex in Arteriosclerotic Epilepsy, or Diffuse Cortical Cirrhosis, *J. Nerv. & Ment. Dis.* **32**:467, 1905.
- Aphasia, *Psychol. Bull.* **2**:261-277, 1905.
- The Rôle of Habit Disorganizations in the Essential Deteriorations (Dementia Praecox) and the Relation of the Deterioration Process to the Hysterical, Neurasthenic, and Psychasthenic Constitutions, *M. Rec.*, 1905, p. 277.
- The Relation of Emotional and Intellectual Functions in Paranoia and in Obsessions, *Psychol. Bull.* **3**:255-274, 1906.



- Fundamental Conceptions of Dementia Praecox, *Brit. M. J.* **2**:757-760, 1906; *J. Nerv. & Ment. Dis.* **34**:331-336, 1907.
- After-Care and Prophylaxis and the Hospital Physician, *J. Nerv. & Ment. Dis.* **34**:113-116, 1907.
- The Relation of Psychogenic Disorders to Deterioration, *J. Nerv. & Ment. Dis.* **34**:401-405, 1907.
- The Connections of the Occipital Lobes and the Present Status of the Cerebral Visual Affections, *Tr. A. Am. Physicians* **22**:7-16, 1907. (See Cushing, H., and Heuer, G. J.: Distortions of the Visual Fields in Cases of Brain Tumor, *Bull. Johns Hopkins Hosp.* **22**:190-195, 1911.)
- Misconceptions at the Bottom of "Hopelessness of All Psychology," *Psychol. Bull.* **4**:170-179, 1907.
- Revision of Aphasia, *Psychol. Bull.* **4**:180-193, 1907.
- Traumatic Lesion of the Pons and Tegmentum with Direct and Retrograde Degeneration of the Median Fillet and Pyramid and of the Homolateral Olive, *J. Nerv. & Ment. Dis.* **34**:699-700, 1907.
- The Problem of "After-Care" and the Organization of Societies for the Prophylaxis of Mental Disorders, Eighteenth Annual Report, State Commission on Lunacy, N. Y., 1907, pp. 160-168.
- The Subconscious by J. Jastrow, book review, *J. Philos., Psychol.* **4**:79-82, 1907.
- Studies in Psychopathology by B. Sidis, book review, *J. Philos., Psychol.* **4**:633-639, 1907.
- Demonstration of Glass Models and Brain Lesions, *J. Nerv. & Ment. Dis.* **34**:711-712, 1907.
- Reception Hospitals, Psychopathic Wards, and Psychopathic Hospitals, *Am. J. Insanity* **64**:221-230, 1907-1908.
- Notes of Clinics in Psychopathology (in collaboration with G. H. Kirby), Privately Printed, 1908.
- The Problems of Mental Reactions—Types, Mental Causes and Diseases, *Psychol. Bull.* **5**:245-261, 1908.
- The Problem of the Public Care of the Insane, *Illinois M. J.* **14**:594-603, 1908.
- The Relation of the Auditory Centre to Aphasia, *Tr. A. Am. Physicians* **23**:116-123, 1908; *J. f. Psychol. u. Neurol.* **13**:203-213, 1908.
- The Role of the Mental Factors in Psychiatry, *Proc. Am. Med.-Psychol. A.* **15**:127-144, 1908; *Am. J. Insanity* **65**:39-56, 1908-1909.
- How Can Our State Hospitals Promote a Practical Interest in Psychiatry Among the Practitioners? *State Hosp. Bull.* **1**:5-14, 1908-1909.
- What Do Histories of Cases of Insanity Teach Us Concerning Preventive Mental Hygiene During the Years of School Life? *Psychol. Clin.* **2**:89-101, 1908-1909.
- The Problem of the State in the Care of the Insane, *Am. J. Insanity* **65**:689-705, 1908-1909.
- After-Care and Prophylaxis, *State Hosp. Bull.* **1**:631-655, 1908-1909.
- Psychotherapy by Munsterberg, book review, *Science* **30**:150-155, 1909.
- Modern Psychiatry: Its Possibilities and Responsibilities, *State Hosp. Bull.* **2**:323-357, 1909-1910.
- A Discussion of Some Fundamental Issues in Freud's Psycho-Analysis, *State Hosp. Bull.* **2**:827-848, 1909-1910.
- The Present Status of Aphasia and Apraxia, in *Harvey Lectures, 1909-1910*, Philadelphia, J. B. Lippincott Co., 1910, pp. 228-250.
- The Dynamic Interpretation of Dementia Praecox, *Am. J. Psychol.* **21**:385-403, 1910.

- The Problems of the Physician Concerning the Criminal Insane and Borderland Cases, *J. A. M. A.* **54**:1930-1935 (June 11) 1910.
- The Nature and Conception of Dementia Praecox, *J. Abnorm. Psychol.* **5**:274-285, 1910-1911; in *Dementia Praecox* (with S. E. Jelliffe and August Hoch), Boston, R. G. Badger, 1911. This is the same as the preceding article.
- Baldwin, J. M.: *Dictionary of Philosophy and Psychology*, New York, The Macmillan Company, 1911. Vol. I. Hysteria (in collaboration with J. Jastrow), pp. 494-496. Vol. II. Mania, pp. 39-40; Melancholia (in collaboration with E. Morselli), pp. 61-62; Monomania, pp. 101-102; Moral Insanity, pp. 104-105; Paralysis, pp. 259-261; Paranoia, pp. 261-262; Psychosis, pp. 392-394.
- Case Work in Social Service, and Medical and Social Cooperation in Nervous and Mental Disease, *Proc. Nat. Conf. Char.* **38**:275-278, 1911.
- Pathopsychology and Psychopathology, *Psychol. Bull.* **9**:129-145, 1912.
- Remarks on Habit-Disorganizations in the Essential Deteriorations, and the Relation of Deterioration to the Psychasthenic, Neurasthenic, Hysterical and Other Conditions, *Studies in Psychiatry, Nervous and Mental Disease Monograph Series*, no. 9, 1912, vol. 1, pp. 95-109.
- The Value of Psychology in Psychiatry, *J. A. M. A.* **58**:911-914 (March 30) 1912.
- The Status of the Medical and Scientific Work in the Massachusetts Hospitals for the Insane, address delivered before the Governor and Council of Massachusetts, the State Board of Insanity and the Superintendents of the state institutions for the insane at Boston, Feb. 7, 1912.
- Relationship of Hysteria, Psychasthenia and Dementia Praecox, *Studies in Psychiatry, Nervous and Mental Disease Monograph Series* no. 9, 1912, vol. 1, pp. 156-162.
- The Aims of a Psychiatric Clinic, *Proc. Ment. Hyg. Conf.*, 1912, pp. 117-127.
- The Henry Phipps Psychiatric Clinic, *Johns Hopkins Alumni Mag.* **1**:287-295, 1912.
- The Nature of Metastatic Tumors of the Thyroid, *Worcester State Hosp. Papers*, 1912-1913, pp. 95-101; *Am. J. Insanity* **69**:543-549, 1912-1913.
- New Formation of Nerve Cells in an Isolated Part of the Nervous Portion of the Hypophysis-Tumor in a Case of Acromegaly with Diabetes, with Discussion of the Hypophysis-Tumors Found So Far, *Worcester State Hosp. Papers*, 1912-1913, pp. 122-136; *Am. J. Insanity* **69**:653-668, 1912-1913.
- Conditions for a Home of Psychology in the Medical Curriculum, *J. Abnorm. Psychol.* **7**:313-325, 1912-1913.
- Introduction to special number of the *American Journal of Insanity* containing addresses at opening of the Henry Phipps Psychiatric Clinic; The Purpose of the Psychiatric Clinic. Closing remarks, *Am. J. Insanity* **69**:835-836, 857-860 and 1079-1086, 1912-1913.
- The Treatment of Paranoic and Paranoid States, in White, W. A., and Jelliffe, S. E.: *Modern Treatment of Nervous and Mental Diseases*, Philadelphia, Lea & Febiger, 1913, vol. 1, pp. 614-661.
- Aims and Plans of a Psychiatric Clinic, *Tr. Internat. Cong. Med. (Sect. 12, Psychiatry)*, 1913, pp. 1-11.
- The Psychiatric Clinique, Its Aims (Educational and Therapeutic), and the Results Obtained in Respect to Promotion of Recovery, *Tr. Internat. Cong. Med. (Sect. 12, Psychiatry, pt. 2)*, 1913, pp. 9-11.

- Plans for Work in the Phipps Psychiatric Clinic: New Johns Hopkins Feature Intended for Treatment and Scientific Study of Obscure Mental Cases; Methods to Be Employed, *Mod. Hosp.* **1**:69-76, 1913-1914.
- Differential Diagnosis of General Paresis, *Am. J. Insanity* **71**:51-58, 1914; *Proc. Am. Med.-Psychol. A.* **21**:193-200, 1914.
- Organization of the Work of the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, with Special Reference to the First Year's Work, *Proc. Am. Med.-Psychol. A.* **21**:397-403, 1914.
- Where Should We Attack the Problem of the Prevention of Mental Defect and Mental Disease? *Proc. Nat. Conf. Char.* **42**:298-307, 1915.
- Organizing the Community for the Protection of Its Mental Life, *Survey* **34**:557-560, 1915.
- Objective Psychology or Psychobiology with Subordination of the Medically Useless Contrast of Mental and Physical, *J. A. M. A.* **65**:860-863 (Sept. 4) 1915; *Studies in Psychiatry, Nervous and Mental Disease Monograph Series*, no. 41, 1925, vol. 2, pp. 29-36.
- The Justification of Psychobiology as a Topic of the Medical Curriculum, *Psychol. Bull.* **12**:328-329, 1915.
- Pathology of Mental Diseases, in Stedman, T. L.: *Reference Handbook of the Medical Sciences*, ed. 3, New York, William Wood & Company, 1916, vol. 6, pp. 400-410.
- The Psychiatric Clinic at Johns Hopkins, *M. Times* **44**:188-189, 1916.
- The Right to Marry: What Can a Democratic Civilization Do About Heredity and Child Welfare? *Survey* **36**:243-246, 1916; *Ment. Hyg.* **3**:48-58, 1919; *Canad. J. Ment. Hyg.* **1**:145-154, 1919.
- The Scope of Psychopathology, *Psychiat. Bull.* **9**:297-305, 1916.
- The Extra-Institutional Responsibilities of State Hospitals for Mental Diseases, *Proc. Joint Board of Trustees, State Hospitals of Michigan*, 1916, pp. 5-13.
- Modern Conceptions of Mental Disease, and the Problem of Sex Education, *Chicago M. Rec.*, 1917, p. 201; in Jennings, H. S., and others: *Suggestions of Modern Science Concerning Education*, New York, The Macmillan Company, 1917, pp. 201-211.
- Organization of Eugenics Investigation, *Eugenics Rev.*, 1917, pp. 66-69.
- The Approach to the Investigation of Dementia Praecox, *Proc. Alienists & Neurolog. Am.* **6**:147-151, 1917; *Chicago M. Recorder* **39**:441-445, 1917.
- Progress in Teaching Psychiatry, *J. A. M. A.* **69**:861-863 (Sept. 15) 1917.
- Psychiatrist Versus Psychologist (in collaboration with C. L. Dana and T. W. Salmon), *New York M. J.* **105**:910-911, 1917.
- The Aims and Meanings of Psychiatric Diagnosis, *Proc. Am. Med.-Psychol. A.* **24**:271-276, 1917; *Am. J. Insanity* **74**:163-168, 1917.
- Mental and Moral Health in a Constructive School Program, in Jennings, H. S., and others: *Suggestions of Modern Science Concerning Education*, New York, The Macmillan Company, 1917, pp. 103-156.
- Modern Views and Propositions on Enforced Treatment for Mental Diseases, *Maryland Psychiat. Quart.* **7**:57-58, 1917-1918.
- Outlines of Examinations, 1918, privately printed.
- The Mental Hygiene Movement, *Canad. M. A. J.* **8**:632-634, 1918.
- The Life Chart and the Obligation of Specifying Positive Data in Psychopathological Diagnosis, in *Contributions to Medical and Biological Research, Dedicated to Sir William Osler, in Honour of His Seventieth Birthday*, by His Pupils and Co-Workers, 1919, vol. 2, pp. 1128-1133.

- August Hoch, M.D., obituary, *Arch. Neurol. & Psychiat.* **2**:573-576 (Nov.) 1919.  
 Dr. August Hoch, *J. Nerv. & Ment. Dis.* **50**:510-512, 1919.  
 Herniation of the Brain, *Arch. Neurol. & Psychiat.* **4**:387-400 (Oct.) 1920.  
 The Integrative Function of a Hospital Laboratory: Retrospect and Prospect, *State Hosp. Quart.* **6**:445-451, 1920-1921.  
 Psychopathology by Edward J. Kempf, book review, *Arch. Neurol. & Psychiat.* **5**:782-790 (June) 1921.  
 The Contribution of Psychiatry to the Understanding of Life Problems, in *A Psychiatric Milestone, Bloomingdale Hospital Centenary, 1821-1921*, New York, 1921, pp. 21-54.  
 Constructive Formulation of Schizophrenia, *Am. J. Psychiat.* **1**:355-364, 1921-1922.  
 The Philosophy of Occupation Therapy, *Arch. Occupational Therap.* **1**:1-10, 1922.  
 Normal and Abnormal Repression, *Bulletin 13, Progressive Educational Association*, September 1922.  
 Occupational Therapy in American Institutions, *Nation's Health* **4**:178-180, 1922.  
 Historical Sketch and Outlook of Psychiatric and Social Work, *Hosp. Soc. Serv.* **5**:221-225, 1922.  
 A Reconstruction Course in the Functional Anatomy of the Nervous System (in collaboration with L. Hausman), *Arch. Neurol. & Psychiat.* **7**:287-310 (March) 1922.  
 Inter-Relations of the Domain of Neuropsychiatry, *Arch. Neurol. & Psychiat.* **8**:111-121 (Aug.) 1922.  
 Growth of Scientific Understanding of Mentality: Its Relationship to Social Work, *Proc. Nat. Conf. Social Work*, May 1923, pp. 192-199.  
 Shall Couéism Spell Progress or Regression? *Open Court* **37**:473-477, 1923.  
 Hall, Granville Stanley (1846-1924), obituary, *Am. J. Psychiat.* **4**:151-153, 1924-1925.  
 Individualism and the Organization of Neuropsychiatric Work in the Community, *Proc. Nat. Conf. Social Work*, June 1925, pp. 444-453; *Ment. Hyg.* **9**:673-685, 1925.  
 Preface to *Birth Control: Facts and Responsibilities*, Baltimore, Williams and Wilkins Co., 1925, pp. V-XI; *The Obligation of Procreative Hygiene*, *ibid.*, pp. 1-10.  
 Insanity, in *Encyclopaedia Britannica*, ed. 13, New York, Encyclopaedia Britannica, Inc., 1926, supp., vol. 2, pp. 478-480.  
 Genetisch-dynamische Psychologie versus Nosologie, *Ztschr. f. d. ges. Neurol. u. Psychiat.* **101**:406-427, 1926.  
 Emil Kraepelin, obituary, *Arch. Neurol. & Psychiat.* **17**:246-248 (Feb.) 1927.  
 In Memoriam: Emil Kraepelin, *Am. J. Psychiat.* **6**:749-755, 1927.  
 The Evolution of the Dementia Praecox Concept, *A. Research Nerv. & Ment. Dis.*, *Proc.* (1925) **5**:3-15, 1928.  
 The Forebrain: A Study and Reconstruction Based on the Methods Outlined by the Authors (in collaboration with Louis Hausman), *Arch. Neurol. & Psychiat.* **19**:573-595 (April) 1928.  
 Freedom and Discipline, *Progressive Educ.* **5**:205-210, 1928.  
 Presidential Address: Thirty-Five Years of Psychiatry in the United States and Our Present Outlook, *Am. J. Psychiat.* **8**:1-31, 1928.  
 The "Complaint" as the Center of Genetic-Dynamic and Nosological Teaching in Psychiatry, *New England J. Med.* **199**:360-370, 1928.  
 Monismus als einheitlich kritisch geordneter Pluralismus, *J. f. Psychol. u. Neurol.* **38**:71-81, 1929.

- Der Mensch als Naturwesen und die Wissenschaft, *Nervenarzt* **2**:472-476, 1929.
- The Objects of Scientific Case Study, *Colorado Ment. Hyg.* **1**:26-30, 1929.
- Reminiscences and Prospects at the Opening of the New York Psychiatric Institute and Hospital, *Psychiatric Quart.* **4**:25-34, 1930.
- What Can the Psychiatrist Contribute to Character Education? *Religious Educ.* **25**:414-421, 1930.
- Maturity, *Child Study* **7**:225-227, 1930.
- Constantin von Monakow, 1853-1930, obituary, *Arch. Neurol. & Psychiat.* **25**:389-390 (Feb.) 1931.
- August Forel, 1848-1931, obituary, *Arch. Neurol. & Psychiat.* **26**:1303-1305 (Dec.) 1931.
- August Forel, M.D., LL.D., 1848-1931, *J. Nerv. & Ment. Dis.* **74**:785-787, 1931.
- Psychiatric Aspects of Gastroenterology, *Am. J. Surg.* **15**:504-509, 1932.
- Organization of Community Facilities for Prevention, Care, and Treatment of Nervous and Mental Diseases, *Proc. First Internat. Cong. Ment. Hyg.* **1**:237-266, 1932.
- Alcohol as a Psychiatric Problem, in Emerson, H.: *Alcohol and Man*, New York, The Macmillan Company, 1932, pp. 273-309.
- The Meaning of Maturity, in Fisher, Dorothy Canfield, and Gruenberg, S. M.: *Our Children: A Handbook for Parents*, New York, The Viking Press, Inc., 1932, pp. 155-168.
- British Influences in Psychiatry and Mental Hygiene: The Fourteenth Maudsley Lecture, *J. Ment. Sc.* **79**:435-463, 1933.
- Preparation for Psychiatry, *Arch. Neurol. & Psychiat.* **30**:1111-1125 (Nov.) 1933.
- Spontaneity, in *A Contribution of Mental Hygiene to Education: Program of the Mental Hygiene Division of the Illinois Conference on Public Welfare*, Chicago, 1933, pp. 21-49.
- The Psychobiological Point of View, in *The Problem of Mental Disorder*, National Research Council, Committee on Psychiatric Investigations, McGraw-Hill Book Company, 1934, pp. 51-70.
- Scope and Teaching of Psychobiology, *J. A. Am. M. Coll.* **10**:93-98, 1935.
- Psychobiology in the First Year of Medical School, *J. A. Am. M. Coll.* **10**:365-372, 1935.
- The Birth and Development of the Mental Hygiene Movement, *Ment. Hyg.* **19**:29-37, 1935.
- Introduction to and Summary of Symposium on the Material of Human Nature and Conduct, *Am. J. Psychiat.* **92**:271-274 and 353-359, 1935-1936.
- Albert M. Barrett, M.D., 1871-1936, obituary, *Arch. Neurol. & Psychiat.* **36**:612-615 (Sept.) 1936; *Am. J. Psychiat.* **93**:499-500, 1936.
- Rückblick auf Mein Leben by A. Forel, book review, *J. Nerv. & Ment. Dis.* **83**:611-613, 1936.



## ADOLF MEYER, THE TEACHER

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A review of the work of Adolf Meyer in relation to psychiatric education leads one inevitably beyond psychiatric education in the narrow sense of instruction for medical students, specialists and nurses to the wide fields of instruction for medical practitioners and the public at large. Meyer received an admirable education to prepare him for the exacting position he has attained. Wide contact with scholars in his home and at the universities of Zurich, Paris, Edinburgh and London made the problems of philosophy and sociology a living reality. His solid training in laboratory methods, clinical medicine and neurology prevented any unfounded theoretical excursions.

Owing to the fact that Meyer spent so many of his earlier years in intimate contact with state hospitals, he has a thorough understanding of the many economic, social and administrative problems involved. His fellowship students are required to spend three months in state hospital service, in order to learn at first hand the magnitude and variety of problems in this important branch of the profession. Here the interested student can review the fully developed psychopathologic picture in detail, as the internist studies pathologic structure at autopsy. That the protean manifestations of fully developed mental disease can be studied with precision is one of the contributions of Meyer, and by precept and example the student is taught to be a careful observer of all aspects of human behavior. Since Meyer is essentially melioristic in his outlook, the student is urged to find the factors which would make prevention of the illness possible. The mechanics for such a study was first developed by Meyer, together with Hoch and Amsden, in New York. Most of the hospitals in the United States now follow in some form the anamnesis and examination of the mental status thus conceived. He said:

In New York my first goal was that of establishing from the start a basic standard of all our hospital work. In harmony with my dynamic conceptions of most mental disorders, I had to reach out, in my actual work, more and more toward a broader understanding of the patients, which led me to a study of the family-settings and by and by also of the place where the individual first became a member of the community, the school. I might also have looked to the church, but since that was too much split up, there seemed to be less hope of achievement.

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From the Colorado Psychopathic Hospital.

From 1904, with the help of Mrs. Meyer, the life of the patient and of the family, the life of the patient in the hospital, and the return to the community began to receive more practical attention. In 1905, to head off an antiquated patronizing after-care scheme, we offered home-visiting and obtained the first psychiatric social worker (see the reports of the New York State Lunacy Commission, Nov. 1905, and Jan. 30, 1906). To enter into the life of the patient we added work on the ward to the existing shop and menial work of making beds and running the floor-polisher and the old institution of maintaining rows of wallflowers. With the help of Miss Burchenal folk-dancing was introduced for group treatment and group pleasure. To get a sense of the opportunity afforded by the schools, I looked into what our patients had shown in their school days. All this tended to give a more concrete meaning to what is at work in psychiatry, intrinsically incidental to the needs of treatment and teaching and investigation in the Ward's Island days.<sup>1</sup>

In all this, I should like to emphasize a deep conviction of mine; viz., that in the end the State Institutions will continue to determine the sense and spirit of psychiatry in this country—not by claiming to dominate and absorb the work, but by bringing their unique experience within the reach of physicians and the public of their districts. The larger state institutions follow the cases through all the stages to where the clinical work can be brought to the final test of practically obligatory autopsy study. They are in a position to show the communities not only the best modern work but also the failures of local civilization. . . . Communities have to learn what they produce in the way of mental problems and waste of human opportunities, and with such knowledge they will rise from mere charity and mere mending, or hasty propaganda, to well balanced early care, prevention and general gain of health, efficiency and happiness.<sup>2</sup>

A great expansion in the application of psychiatry to current problems came about through the work of Goddard, who was a pupil of Meyer at Clark University, the Juvenile Court work of Healy and Bronner, the surveys of the National Committee for Mental Hygiene and the inclusion of the aid of psychologists and social workers to help staff the organizations then being created. The conviction of Meyer regarding the preventability of much mental disease found another channel of expression in the creation of the Mental Hygiene Movement by Clifford Beers in 1907. Meyer not only coined the term "mental hygiene" and gave freely of his time and energy but provided the movement with an optimistic point of view which encouraged the idea of the preventability of mental disease in a day when this was far from being a current belief and yet was grounded in solid clinical experience. Through the publications of the Mental Hygiene Movement, the ideas of the psychobiologic school have reached thousands of persons who otherwise would never have heard of them. Thus, it is difficult to estimate the full sphere of influence of Meyer's teaching, since so many

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1. Meyer, Adolf: *Thirty-Five Years of Psychiatry in the United States and Our Present Outlook*, *Am. J. Psychiat.* **8**:1 (July) 1928.

2. Meyer, Adolf: *Reminiscences and Prospects at the Opening of the New York Psychiatric Institute and Hospital*, *Psychiatric Quart.* **4**:25, 1930.

of his contributions have become a living part of the community and of the great reservoir of common knowledge. To few teachers is it given to find such immediate acceptance and wide promulgation of their doctrines, enabling them to become a vital force in the active social life of their time.

With the opening of the Henry Phipps Psychiatric Clinic in 1913 and the august assemblage brought together for the occasion, there was signalized a new era in psychiatric education throughout the United States. In this clinic high standards in both teaching and practice have been rigorously upheld, so that now its methods and ideals have become those of many clinics widespread throughout the land. Of the many types of training Meyer chose the apprenticeship system as the most suited to his needs. Since his primary scientific premise was that first hand observation of the patient is the pathway to knowledge, he insisted that the student-physician should be in intimate daily contact with the object of his studies. The student was required to exert his own initiative both in observation and in formulation of the case, as well as in the direction of treatment. Meyer insisted on hearing a student's native comments and had little interest in "popular" interpretations. With this desire for the expression of independent opinion there was the greatest tolerance for the opinions of others so long as they were genuinely derived from the facts in the case. With rare tact, he avoided the infliction of his opinion on his associates; he preferred by critical review of the facts to leave ultimate decisions open, so that each member of the staff could come to his own conclusions.

The actual plan of instruction for undergraduates now in use at the Henry Phipps Psychiatric Clinic is described by Dr. Meyer as follows:

I stand for the principle of keeping the first-year work within the purview of the normal. The course is given with a questionnaire furnishing the student an outline with which to review the determining facts and factors that led among other things finally to the entrance into the medical school. In order to dispel the traditional idea that it would all be introspection, I ask also for a characterization of the three most different classmates. Each entity figures as an "experiment in nature." This preliminary step is accomplished by an account of the evolution of his ideas of mind and body from childhood up to the present and through what contacts with psychology the student may have had. The actual course is arranged so that each one of the eight two-hour afternoon sessions of the third quarter of the first year presupposes that the student has organized his own experience with a definite person, himself or another, following a questionnaire bringing out the material which he has to work on. This is an equivalent of a laboratory experience, which activates what we can then discuss without remaining in the abstract.

Sessions are then divided into an hour's class discussion and an hour's group work, twelve students participating in the examination of a patient under the direction of an instructor. The students get a summary of the case record in

which they are asked to note in the margin the outstanding facts which require special attention and grouping in a plan for the examination of the case in harmony with an orderly outline. They are requested to formulate and record the questions and responses, to see that the standard topics are covered and summarized, so that an interpretation of the case can be added to the record. The case report is handed to the instructor for comments and corrections after two days, and returned to the student at the next demonstration. The students are urged to add an extra sheet with their questions that may arise and should be answered by the instructor or by myself. An epitome of the pathergasias or intelligible reaction-sets and their study and use is given in mimeographed form.

At the end of the second year an examination on these introductory courses is given, before the student is admitted to a further course in the dispensary with the full responsibility of taking the histories and making the examination (16 two-hour sessions in one quarter of the third year). The work (and its record) is controlled by instructors and discussed and used for the plan of recommendations and treatment.

In the fourth year each student has to make at least six case studies and to hand in his report. The rest of the training consists of elective courses on treatment, on the internal medical contribution, on the work in the psychobiological and neurological and internal medicine laboratories.

There is no intention to prescribe any definite program of teaching. The above plan is merely offered as a sample of what has proved practicable with a schedule of about 72 hours of supervised prescribed work distributed in a four-year curriculum.<sup>3</sup>

The apprentice at the Phipps Clinic, whether graduate or undergraduate, is introduced to psychiatry by an arduous drilling in obtaining a detailed "complaint" from the patient, which must touch all phases of the psychobiologic unit; he must examine and reexamine the development of the illness until motives and causes become sharply defined and the illness itself becomes intelligible as the logical outcome of that particular organism's being subjected to those life circumstances. By skilful planning of the treatment, with the help of the older staff men, the apprentice is taught the special technics of symptomatic and causal therapy in its many ramifications.

It is at the daily ward rounds that Dr. Meyer is seen at his best. With the touch of the master clinician and teacher, he imparts a spark to the meeting which makes the spirit of medicine a vital, living force. His ability to size up each patient quickly and to approach effectively the problems elicited is unequaled among clinicians of my acquaintance. In the staff conferences one notes his willingness to spend time in detailed inquiry about the essential facts in each case and to discuss, formulate and reformulate facts in the light of new information and additional opinions of staff members. The sensitive management of the patient's conflicts, the tact and the understanding of human nature

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3. Meyer, Adolf: *Psychobiology as First Year Work*, J. A. Am. M. Coll. **10**: 365, 1935.

shown in his relations to the patient are the highest expression of the physician's art. With careful consideration the patient's assets are brought to light and redirected into more useful channels, so that the patient is able to meet his own problems rather than be dependent on the physician. Yet it is within Meyer's power to exert strict discipline when this is in the best interest of the patient. Understanding and sympathy in the best sense are always in evidence, but never a sentimental mollicoddling or superficial reassurance which fails to grapple with the real conflicts which contributed to the patient's illness.

In the exposition of a case there is expected of the staff member a full elucidation of the complete complaints as they occurred in their natural setting. The patient is the object of study; hence his recital is valued as first hand data in reconstructing the development of the illness. Lengthy accounts of the indirect and the direct examination, with ample verbatim statements, are expected, and no work-up of the case can meet with approval unless the groundwork has been meticulously disclosed. Censure is earned by hurried or superficial examinations, for the ideals of the clinic demand thoroughness and a willingness to work out the facts of a case, even to the minutiae, for many of the latter may be important in that a fact is defined as "anything which makes a difference." Then the staff member is expected to evaluate critically the results of his examinations, to give meaning to the moving drama of the development of the illness and to give life to the factors which caused the particular person to become what he is. Rigid postulates and easy clichés regarding cause and effect are not tolerated in establishing the continuity of the illness. That the form and coloring of mental illness are as wide as life itself is a favorite thesis with Meyer. The presentation of the possibilities for modification and treatment and the practical means by which these are to be attained follow the unfolding of the panorama of the patient's life. The daily regimen of the patient is planned, keeping the objectives of treatment in mind. This intimate care of the patient characterizes one of the best phases of psychiatric training at the Phipps clinic.

A map showing the distribution of the past and present members of the Henry Phipps Psychiatric Clinic is inserted. The eighty-three teachers indicated in *A* completed a full training course at the Phipps Clinic; they represent 12 per cent of the total number of teachers of psychiatry (690) listed in the United States.

Psychobiology is developed in Meyer's lifelong teachings. It is inherent in his discussions of subject organization, personality organization, symbolization and individuation and their practical application in the personality study, the life chart and other study technics. The student is not given postulates in a spoon-fed, academic manner but





Maps showing the distribution of Dr. Meyer's pupils (*A*) in North America, where there is a total of eighty-three teachers and fifty-eight practitioners, and (*B*) in the eastern hemisphere, where there is a total of seventeen teachers and ten practitioners.

is led to his own formulations by actual acquaintance with personality organization and the various grades of disorganization; he is taught to be critical of easy formulations and of the changing "styles" in psychiatric thinking and research, to maintain discretion and restraint when attempting to define causes and to place the emphasis on the "how" rather than the "why" until clearcut causation is evident.

The following paragraphs summarize the fundamental tenets of psychobiology.

We grant the right to use what we know in everyday life of the nature of man and the factors playing a rôle in shaping life's course in terms of psychobiologically integrated functioning or *ergasias*, i. e., those objective events including symbolization or meaning function in determining and constituting behaviour and conduct—in reality exactly that which the person of sound and critical intelligence uses in daily life as well as in the strictly scientific pursuits. This allows an orderly integration of the apparently heterogeneous sciences and data we meet in the study of man. We need a definite place for the formulation of the "story" of the events in terms of an objective psycho-biology—an acceptance not only of the structure-function of physiology (as it limits itself to the study of the functioning of detachable parts), but also of the total functions of the biological organismal unit or individual, the "he" or "she," the organism as a person, in the service of its specific life-cycle, not merely as an addition of something extraneous, but as a differentiation and functioning containing all that is basic; the physics and chemistry and the organization by growth and the products of life-experience. This makes of mind a mode of subject-organization, functioning without destroying the relations (attitudes, reactions and actions), actually developed and activated or operative; it constitutes a biographic-historical and inter-functional and structure-functional reality record, using the best Huxleyan organized common sense, and freedom from obsessive puzzling and worries over interaction, and also freedom from supposedly "scientific" mechanization. We need a sound attitude toward the usual and the unusual, the normal and the less normal, what is structure-tied and habit-tied or more plastic; open to study in terms of . . . experience and creative ability. We learn to work with the physico-chemical and reflex conditions and functions, and with the flow of the more plastic meaning functions, or consciously integrated activity, the differentiation and building up of subject-organization and personality-formation and the type and range of preparedness for the now and here, for short-term and long-term adaptations and performances. In short, we deal with objectively formulated psycho-biology, with *ergasias* or performances or functioning of individuals and groups, operating with the help of or in the form of symbolization or meaning-function, subject to the same "reduction to experiments of nature" as constitutes all science of nature, including human nature and its working. . . .

We need a balanced knowledge, sufficient to be able to foretell within reasonable limits what can be expected of the person in specific tasks and situations, and with regard to the individual's health, happiness and efficiency.<sup>4</sup>

What then are the fundamental gains that stand out in the growth of the scientific understanding of mentality?

4. Meyer, Adolf: The Fourteenth Maudsley Lecture: British Influences in Psychiatry and Mental Hygiene, *J. Ment. Sc.* **79**:435 (July) 1933.

First, a growing conviction that, as far as possible, we want to go by concrete performances, and not general impressions; that we are dealing not with abstract mentality, but with performances in intelligible and controllable situations, with full confidence that we do justice to both critical common sense and the fundamental principles of science when we single out the human problems worthy of study and calling for work, determine the conditions under which they arise, their working, and the means of experimental modification. With a reasonably well-planned personality record we find in the sphere of psycho-biological, biological, sociological, ultra-biological, mathematical, and other sets of integrations.

A second important gain is the realization that we must consider the individual as a personality, and also the stock from which it was born and the setting in which it grew up, on the basis of a reasonably full life-history.

The third point is a growing confidence, important especially for our relation to the law, that, in proportion as fairness and sound judgment become the rule, we shall be able to overcome the traditions which make people distrust unbiased and unlimited study of facts and still prefer legal and other traditional and arbitrary limitations of evidence and of practice in the work with human beings and their problems.

The fourth point is the conviction, no doubt comforting to those who suspect us as reformers, that there is no room for perfectionism in modern psycho-biology and in social work, but that our philosophy is satisfied to be a sound meliorism, with faith in human effort. As a background for these developments, unfortunately we still find about us, and sometimes in our midst, the heritage of the past ages and the result of "sleepy" and uncritical notions of omnipotence of thought, calling the really archaic mental attitude "new thought"; and another extreme that of complete distrust of anything that smacks of psyche or mind and soul and spirit.

Let us remember that we have a science of man called "physical anthropology"; we should cultivate also a functional anthropology and not only physiology on the one hand and ethnology on the other, with a psychology left too much in the abstract. With a sound practical sense for the sweeping or specific assets and problems of the individual and of social groups, we are working for a growing understanding of man's nature and mentality as a solid basis for social work, and also of a sound and progressive law, especially if we study the performance also in the light of what I have here called constructive composure.

To sum up: the human mind has a limited capacity or range of attention. It is apt to become one-sidedly focussed. In the scientific study of mentality there have been conflicting lines of emphasis, some due to presuppositions inherited from the long prehistoric periods of mankind; then the overeager quantitative perfectionism and elementalism; then the insurgent tendencies of psychometrics and psycho-analysis; but, in the background, a steady development of an objective psycho-biology, keeping its feet on the ground of a scientifically critical, common-sense approach. It furnishes a well-balanced setting for social work and law, with an interest in the normalities rather than the sensational, and also, while basing itself on objective concrete performance, making a specially needed point, not only of the acceptance of success and failure as a scientific criterion, in addition to purely quantitative measuring, but also of the call for consideration of what I chose to term "constructive composure."<sup>5</sup>

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5. Meyer, Adolf: *Growth of Scientific Understanding of Mentality: Its Relationship to Social Work*, Proc. Nat. Conf. Social Work 50:193, 1923.

Meyer's work on dementia praecox (parergasia) is the boldest of his theories—the one most difficult to grasp because of the many conflicting constitutional and organic theories, and therefore the one most attacked. Meyer has the courage to stress the influence of environmental factors in the pathogenesis of disease, while the bulk of European scholarship stresses the fixed genetic factor. Meyer is aware of the constitutional fraction of the integrated organism, but he prefers to put the primary emphasis on the possibilities for therapeutic modification and not on prognosis; he holds the goal of the physician and helper before that of the nosologist. As a teacher, however, he has emphasized the need for observation of prognosis, for it is "one of the best methods of training in psychiatry: To formulate in exact terms the facts which guide us in prognosis, to give the reasons why they do so, and to test these reasons on the basis of the final results."

The result of Meyer's teaching in the management of the affective disorders (thymergasias) is far reaching and can be seen in the work of Hoch, Kirby, McCurdy, Greenacre, Hohman, A. J. Lewis, Gillespie, Diethelm and Muncie. The actual day to day technic in the care of these disorders has been developed to a high degree and is one of the more gratifying results of the methods advocated.

As a descriptive label is often necessary in order to communicate intelligently about psychobiologic disorders, the term "reaction types" was settled on as the most useful for genetic-dynamic purposes. Meyer coined special names with the root "ergasia" to designate the distinctive dynamic quality of the concepts he described in the "reaction types."

Owing to Meyer's insistence on full knowledge of a case, his students have become physicians who have thorough training in internal medicine and a proper respect for the specialties. This is particularly evident in the able care which they give to the toxic-organic reactions. There is no brighter chapter in the history of psychiatry and medicine than the attention given by psychiatrists to the symptomatic psychoses (dys-ergasias), with proper utilization of all the discoveries in the basic sciences.

Meyer has been untiring in his efforts to further the advancement of psychiatry through the establishment of training centers. He has supported White's vision for the unification of affiliated associations and May's efforts to create local societies as recruiting stations. The establishment of the American Board of Psychiatry and Neurology, in 1934, was the culmination of one of these ideals. His presence on that board has been an invaluable aid toward expediting its efficient organization.

Meyer has been a great factor in the success of the Division of Psychiatric Education of the National Committee for Mental Hygiene.

Throughout the discussions on educational topics, I felt the force of his definition of psychiatry as representing the study of the pathology and therapy of "the person" and was reminded of the importance of this study in the training of every physician, and not only of the specialist in the field. Although he had an exceptionally fortunate teaching and hospital unit at Baltimore, he was keenly interested in the status of other schools and reviewed carefully the reports made by me in 1932 and 1933. He stressed constantly the importance of plasticity in standards rather than unimaginative, monotonous adherence to classification by the number of hours spent in teaching. As chairman of the Advisory Committee on Psychiatric Education of the National Committee for Mental Hygiene he had another instrument through which his mature wisdom and keen judgment were brought to bear on the affairs of an active world.

Psychiatry is often derided as a "verbal science," a renegade from the field of the physical and biologic sciences, a victim of the obscure and involved material with which it must work. Meyer is the most stalwart spokesman for the scientific method, advocating that facts observed, studied and recorded will present their essential elements and be worthy of the name of science. He has forged in the clinic and at the bedside instruments by which the difficult and recalcitrant facts may be made meaningful.

With John Dewey, Meyer has faith—faith which expresses itself in a tendency to action and which can be tried and tested only in action. While he lauds reason and critical common sense, he accepts responsibility, with freedom from cheap cynicism and spiritual indolence. Meyer, the teacher, recognizing in well integrated man a superior creative ability and spontaneity, reaffirms the power of man to master his difficulties. His is the living philosophy which must face life and society in their complex wholeness, avoiding the deceptive simplifications which renounce the whole. His steadfast courage and optimism, his continuous loyalty to both ideals and friends have stimulated his associates to greater productivity. Although he has been critical, he has escaped destructive iconoclasm by building on the firmest of foundations—tested clinical experience. He has given medicine psychobiology, wherein lies the hope of a sound unification of a world of conflicting theories.



## THE PSYCHOBIOLOGIC UNIT AS A PATTERN OF COMMUNITY FUNCTION

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The psychobiologic unit is the feeling-acting-thinking person, the living man as contrasted, on the one hand, with the cadaver and, on the other, with a sensitive-responsive part of a person, e. g., the heart or the stomach. In brief, the psychobiologic unit is the person as he is busied with his work, his pleasure, his rest, his growth and creativeness, his safety or whatever else may occupy him.

It is hard to be so simple as to conceive of the psychobiologic unit as nothing more or less than a functioning person, since the concepts of the functioning person vary greatly, depending on differences in the orientation, experience and life interests of the observer. At the one extreme, one finds the primitive, naive, unanalyzed concept which takes the person at face value, undisturbed by scientific or mystic inquiry with its revelations or presumptions of internal or partial structure and function and external relationships. The brain, the synapses, the glands or oedipus complexes or demons do not enter the picture, and there is no distortion of psychobiologic phenomena to align them with professional disciplines, e. g., healing, law and theology. This primitive concept of the psychobiologic unit takes man's workings at their face value and attempts no such segregation as the spiritual and the mundane, the emotional and the intellectual, or the physical and the mental. This virgin concept appears usually in partial or modified form in various ways from culture to culture, as the failures of scientific or mystic analysis have left the parts together in pristine form.

At the other extreme, a similar integrated concept of the psychobiologic unit has come about in a different way. Whereas the unity of the naive reflects the absence of analysis, the integrated picture, at the other extreme, is the result of a synthesis accompanying or following careful scientific study and a critical appreciation of parts. This synthetic unity is likewise theoretical, since the analyses are still imperfect and mixed with the mystic and education has so fixed attention on parts as often to block one in attempting a resynthesis.

Between these theoretical extremes one finds the actual, existing concepts, with their proximities to either extreme and with their mixtures of the naive, the analyzed, the synthesized, the scientific and the mystic. One finds the brain and the nervous system personalized as

the spirit of intelligence in the West, whereas in China the intelligence is embodied in the stomach and the pitfalls lie in a gastrologizing tautology.

The specific concept of the psychobiologic unit has profound social significance. It is inevitable that persons should behave toward themselves and their fellows individually in terms of the pattern designed by their concepts of the psychobiologic unit and that each should accordingly, in proportion to his strength of leadership, influence the pattern through which his group or his community makes itself useful to its members. Community agencies, institutions and practices reflect a composite concept of the biologic unit. In its most primitive form the community function will be much of a unity, with less division of labor; farther along, the divisions of labor will be more numerous and more sharply demarcated, whereas at the other extreme a resynthesis will be expressed as functional coordination of administratively separate units, with generous zones of overlapping function.

One may imagine, for example, a city of 120,000 in which the leading person in the medical group conceives of annoying human behavior as uniformly explicable through pathologic changes in the brain, and in which a leader in the educational field is satisfied that there is a clear boundary, with no overlap, between psychiatric treatment and the functions of a classroom teacher. This city consequently aims to set up a psychiatric service for children under the supervision of some one whose chief qualification must be proficiency in neuropathology and neurology and who must function independently of the schools.

This dependency of community function on the prevailing or composite concept of the function of the people is socially significant. The prevailing concept is generally so imperfect that the services of the community are seldom attuned to the needs of its citizens. Not only is community function subject to the popular misconceptions of psychobiologic fact, but this defect is enhanced by a general desire for simple mechanistic explanations and for categorizing. The inability of the average citizen to encompass the psychobiologic abstractions as they are now phrased and the many dimensions of causation as they are constantly expanding, his resistance to that which is not clear to him and his refusal to revert to the more primitive naive unity all force one to conclude that the correction of defects of community function requires more strategy than merely finding out what the pattern ought to be.

As long as the popular psychobiologic concept is confined to an invading spirit, a disordered stomach, a pressed-on brain, lack of education, poor housing or lack of play and as long as these can or must be accepted as each in itself a sufficient explanation of a peculiarity of

behavior, it is inevitable that the response of society in the organization of any phase of community function will be similarly narrow, isolated and competitive. Narrowness, isolation and competition characterize all the phases of community function as they now exist in most places. This is because two essentials are lacking in the present psychobiologic concepts that shape community function: (1) Psychobiologic phenomena are the product of a multiplicity of contributing factors varying greatly in their weight of influence, and (2) the various psychobiologic phenomena in any one person are related, i. e., they have important contributing factors in common, though of different weight, and they reflect the integration of the person.

The relatedness and multiple determination of human behavior are apparent when one attempts to study the genesis of various psychobiologic phenomena. Let it be imagined, for example, that one plans one study of the genesis of friendships and another of the development of vocational interests. It is soon found that in both studies one must deal with the same fundamental experiences of the child, his family setting and interests, his sequence of social experiences, his capacities for self-expression, etc. One finds that these two apparently different forms of expression are really the fruition of a common experience; they are facets of a personality and have the coloring of that personality. One can trace neither to a single source but finds that they represent a convergence of many earlier experiences. In fact, there is hardly an earlier experience that has not contributed to the facet of today, which itself is only a stage in the development of that of tomorrow.

The appreciation of this relatedness and multiple determination is conspicuously lacking in the concept of the psychobiologic unit after which the community is patterned. The community is correspondingly defective. It divides its functions into compartments—divisions of labor, administrative departments representing supposedly different human needs: health, education, protection, transportation, work and play. A public prosecutor may consort with criminals in his private life (friendships) and be considered a safe person in his vocation. Division of labor is necessary, but, unfortunately, the community deals with these individual functions as if they were distinct and fundamental rather than man-made divisions of the psychobiologic surface representing related and continuous basic needs of people. This community defect is in itself a psychobiologic expression of multiple origin; the vested or bureaucratic interests of those in charge of these divisions of labor enhance this compartmental pattern, but it is the prevailing popular weakness or absence of appreciation of the relatedness and multiplicity of determination that allows the schisms to occur.

The very selfishness of the vested interests is in itself unintelligent and exerts a stunting effect because of this blindness to relatedness. It fails to appreciate that its own bureaucratic growth cannot take place in narrow channels. The expansion of any community function, such as an advance in public health, requires and induces an advance in all others, such as education, and retardation in the one holds back the whole community organism. Often, advance in one field must await the removal of lag in another, and intelligent selfishness of the vested interest in the growth of the first would demand a centering of effort on the growth of the second. The prevailing unintelligent selfishness that characterizes divisions of government and that is generally retarding to the advancement of community function tends to defeat itself, for it grows out of a defective psychobiologic pattern. The department of health can for a while say to the schools, "You do your job and keep out of ours"; but it will eventually find that it is shackling itself, for the two are not easily distinguishable at all points.

It is not only the failure to throw support when necessary to another phase of community service that is serious; often competition develops to the point of becoming cutthroat, when the function of the other community service is designedly undermined. It is not appreciated that the community's facilities for meeting, for example, the educational facet of its people cannot be effective if the play or security facet of that personality is deteriorating. Civil growth suffers generally as a consequence.

As a result of limited psychobiologic appreciations, the structures behind community function are seldom rounded and complete; the community that is recognized as a shining example in one field is a laggard in another. Great gaps in community services occur, and the more mature services that are secure for today merely feel sorry that their sister field is "down," not realizing that their value, too, is lowered. Ephemeral overgrowths of limited aspects of community function follow the intensive drives of narrow-gaged enthusiasts in this or that direction. As one looks about, he sees that one community has put most of its effort into medical services and is given wide repute, without its realizing that its health is endangered by its narrowness. Another community is noted for its schools, while many of its social services are poorly organized. In still another the family agency got control of the purses early and has held tight, while other needs have been ignored. It is not the spurts of growth that violate the integrated psychobiologic pattern, since all growth is intermittent and focalized. The violation exists in the dissipation of valuable community effort in a vain struggle to continue growing at one point, when the returns diminish, pending growth at another.

Even when the balance of community departments is fairly good, case by case function is contrary to an integrated psychobiologic concept demanding the joint participation of several agencies. How does a person in need know what agency can best serve him? It is often a matter of chance whether the need or difficulty of a person comes to evidence first in this or that facet of his personality. The child who grows up in a quarreling, tottering family may reveal his problem in undernutrition, truancy, failure in school, stealing, neurotic obsessions or dependency arising from abandonment or neglect. Whatever the presenting facet, one knows that it does not reflect the whole story and that the other facets are also affected. It is thus also a matter of chance whether the person comes first to the attention of this or that agency of community service and whether or not the one he appeals to is the most appropriate. It is obvious that a restricted psychobiologic perspective results in a service to this person not by his community but by an agency which has developed an autonomy that none of his own personal facets enjoys. It is obvious that if his needs are to be served in keeping with his psychobiologic constitution the agency to which his problem is presented must conceive of itself as an agent not only with special technical function but of all community function, a holding agency for the citizen while he is being served by the community through its various specialties representing divisions of labor. An appeal to any agency for help would thus be construed not as *prima facie* evidence of the specific need for that agency, not as a call on its specialized technical resources but as, in actuality, an appeal to an undifferentiated application bureau which leads to all community functions and in which such functions as are needed may be skilfully drawn on without jeopardizing the values of the spontaneous original appeal and the relationship to this one representative of the community. In instances this receiving agency would find that its special function coincides with the prominent aspects of the citizen's difficulty, and it would continue in the position of leadership in piloting community service to him. In other instances it would so continue only because of the jeopardy of changing pilots. In still other cases it would shift this leadership to an agency the specialized function of which coincided more exactly with the high points and needs in the case. Wherever the leadership, it would see that the job to be done is one community job for one integrated psychobiologic unit, not several isolated agency jobs. Whatever this, or any agency, did would accordingly be done as one of the divisions of labor, to be resynthesized by joint scrutiny of examinations and joint planning and prosecution of activities as a program to meet the need.

Contrary to the prevailing notion of urban refinements, this ideal comes closest to realization in small communities. Urbanization has



refined detailed technical procedure and specialization of labor but has, at the same time, strengthened the bureaucratic trend and increased the parts, often beyond hope of reassemblage. It seems as if the dispersive trend must continue unless some integrative mechanism is established, as it has been in the psychobiologic unit—some superfunctionary whose job it is to see the community in the perspective of an integrated psychobiologic unit and with enough skill and authority to beguile the parts of the community into a similar coordinate relationship.

## AMNESIA

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A discussion of amnesia must involve both physiologic and psychologic concepts. The functions of which "amnesia" denotes the absence should be conceived as constituting a process for which "remembering" is an appropriate name, since it suggests activity, in preference to "memory," which suggests something passive only. Memory in this limited sense of a trace which influences subsequent reactions is something very old in the history of organisms. It is even found in non-living material of such simple structure as a gel.<sup>1</sup>

Remembering, as I use it here, is an activity of the ego, or of the "highest level" of the organism, in Hughling Jackson's sense. "Remembering is not the excitation of innumerable fixed, lifeless and fragmentary traces. It is the imaginative reconstruction built out of the relation of our attitude towards a whole mass of organised past reactions of experience" (Bartlett<sup>2</sup>).

These reconstructions Bartlett called "schemata." It is likely that the earlier schemes follow the line of demarcation of the special senses. Thus, appetites, like food seeking and sleeping, and instincts, like fear, determine the form of the schemata. Temperament—which evidently Bartlett believed, and I agree, is best regarded as a matter of pattern of relative strengths of the appetites and instinctive tendencies—and character are next involved. There goes on all the time an unwitting analysis giving weight to certain elements, and the weighted details stand out in images. "Images are the details picked out of schemes." The use of words is determined partly by the need to communicate images from one person to another. Words and images, however, which are at first used to break up schemes, tend themselves to become automatized. Hence in pathologic conditions the ability to use words may be fully retained when no "remembering" either in the full or even in the simply mechanical sense is possible.

### COMPONENT FUNCTIONS OF REMEMBERING

Remembering traditionally involves registration, retention and recall, but the total process can probably involve other functions in addition to

1. Bayliss, W. M.: *Principles of General Physiology*, London, Longmans, Green & Co., 1916.

2. Bartlett, F. C.: *Remembering*, London, Cambridge University Press, 1935.

these. One of these functions is time ordering of experience. A "time consciousness" is postulated as an important element of psychic activity by various authors, e. g., Lewis,<sup>3</sup> who cited instances of disorder of this function in a wide variety of psychiatric conditions.

Another function is the feeling of "pastness," which pertains to experience and which appears to depend on a separate and basically physiologic function, not the same as time ordering, since it may appear as an isolated and characteristic experience in epileptic states in the form of a feeling of familiarity (*déjà vu*) for a situation which has none of the other marks of a truly remembered experience.

Whether what Bertrand Russell<sup>4</sup> called the "emotion of belief" is a further separable element indispensable to a complete act of remembering or whether it arises only from the presence of all the other factors in a complete experience is a matter for speculation. An element in remembering which is certainly bound up with this "emotion of belief" is the awareness of the continuity of one's personal identity so that one can say "This happened to me"; the kind of remembering involved in saying "I visited Paris in 1925" is different from what is implied in saying "Waterloo was fought in 1815." Both are acts of remembering, but the latter is much simpler than the former. It is an example of the so-called "mechanical" type of memory, as compared with the personal type of remembering. That continuity of personal identity and mechanical memory are separate phenomena is shown by clinical cases in which mechanical memory, when tested, is found to be intact but the recollection of every-day events in the patient's life, up to a given date, is lost. This differentiation is the more convincing when not only immediate mechanical memory but the memory for things learned in the past persists, while the recollection of events with a personal origin is difficult or impossible.

Kohnstamm recorded the case of a man who had complete retrograde amnesia for personal events and retrograde amnesia for every-day events, which he forgot at once, but who could remember previously acquired data, such as the names of political parties and school knowledge, e. g., calculation. Although he forgot immediately all that occurred around him, he would retain a string of figures, which he learned in the mechanical way, often with 50 per cent accuracy, while verses which he learned could be recollected more or less the next day. In discussing amnesia, therefore, one must note that it may reflect failure at one of several levels or, alternatively regarded, may be the outcome of the falling out of one of a number of functional elements. What has been called the sensorimotor level of remembering, involving no more than

3. Lewis, A. J.: *Proc. Roy. Soc. Med.* **21**:611, 1931.

4. Russell, Bertrand: *The Analysis of Mind*, London, The Macmillan Company, 1921.

registration, retention and recall—and the latter probably in a very elementary sense—can evidently function when complete acts of remembering in the sense I have described are impossible.

Imagery of the eidetic type evidently belongs to this level of activity, but images in the sense in which they usually exist in adults are, according to Bartlett's recent analysis, the product of a much less immediate and more complex type of mental function. Hence, a rote or sensorimotor memory (e. g., ability to reproduce symbols) may persist while orientation fails, from failure to form images by abstraction from sensory experience. Thus, for example, in Korsakoff's psychosis there is disorientation but, contrary to general belief, retention tests may be fairly satisfactorily performed. The disorientation cannot, therefore, depend merely on failure of retention. Pfeiffer suggested that there is a defective comprehension of visual space—presumably the result, in Bartlett's theory of remembering, of failure to "extract" images.

If anything further is required to prove the independence of mechanical memory and memory of the more organized types, it would be Brodmann's curious case. He observed in a patient with a polymenuritic psychosis the opposite state of affairs, in which every-day personal events were recollected, while series of syllables were immediately forgotten. This illustrates the danger of regarding some processes apparently complex, such as associative recall, as necessarily "higher" than others apparently simpler, such as retention in the mechanical sense.

Remembering in the complete sense of this analysis is a personal act and depends on the following factors, which can be distinguished on the basis of a conjunction of psychologic analysis and clinical observation.

Factors in Remembering	Conditions in Which these Factors Are Interfered with or Appear in Isolation
(a) Registration	Acute organic reaction type (delirium); manic excitement (inattention); hysteria (global inattention)
(b) Retention	Organic reaction type in general
(c) Recall	
(1) simple and elementary	Organic reaction type (severe degree)
(2) As a voluntary act	Psychogenic conditions, e. g., hysteria; certain forms of organic reaction type, e. g., trauma to the head; Korsakoff's psychosis; epilepsy
(d) Time Sense	Various psychoses with depersonalization (?); Korsakoff's psychosis (amnestic symptom-complex)
(e) "Pastness"	Epilepsy ( <i>déjà vue</i> ); anesthetic states

5. Footnote deleted by the author.

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|---|---|--|
| (f) Associations determined by              | $\left\{ \begin{array}{l} \text{sense organs} \\ \text{appetites} \\ \text{instincts} \\ \text{interests} \end{array} \right\}$ | $\left\{ \begin{array}{l} \text{Organic reaction} \\ \text{types in general; psychogenic} \\ \text{conditions} \end{array} \right\}$ |
| (g) Imagery ("extracted images of Bartlett) | Korsakoff's psychosis;<br>early senile dementia   |  |
| (h) Personal Identity (awareness of)        | Hysteria;<br>depersonalization<br>in various psychoses  |  |

(a) *Registration*.—Defects in this process are not of great interest, as they are of the type of failure of attention, e. g., from distraction, as in acute mania, or of the failure of attention that accompanies any severe psychologic disturbance of cortical function, as in febrile delirium. Failure of registration of a different order, and of a curiously localized kind, may occur in hysterical conditions. The concentric limitation of the visual field is a well known example. That much that is apparently missed in hysterical subjects is actually registered was demonstrated by Morton Prince in his experiments with hypnosis and automatic writing. The failure of the hysterical person to attend and therefore to register is sometimes grotesque, as in the case of a woman who could see everything in the room but myself when she came to the hospital. Such instances can be so gross as to make incredible any symptomatic distinction from malingering. I shall return to the conception of hysteria and its relation to malingering, and the bearing of this on the problem of amnesia.

(b) *Retention*.—On the trace theory of memory failure of retention would be the most frequent and fundamental factor. But, in fact, failure in one of the other functional elements must often be mistaken for failure of retention, even in diseases in which gross physiologic alteration undoubtedly exists. For example, it has been found that a patient who has recovered from Korsakoff's psychosis may recollect events after his recovery that he did not appear to note at the time.

Korsakoff<sup>6</sup> himself noted that in some patients events occurring at the time of the illness, which they did not appear to retain at the time, were recollected years after. Bonhoeffer<sup>7</sup> showed in his experiments with visual impressions that what was apparently not retained at the time could be recognized later. Grünthal<sup>8</sup> concluded that the apparent

6. Korsakoff, S., in Bumke, O.: *Handbuch der Geisteskrankheiten*, Berlin, Julius Springer, 1928, vol. 7, pt. 3.

7. Bonhoeffer, K., in Bumke, O.: *Handbuch der Geisteskrankheiten*, Berlin, Julius Springer, 1928, vol. 7, pt. 3.

8. Grünthal, M., in Bumke, O.: *Handbuch der Geisteskrankheiten*, Berlin, Julius Springer, 1928, vol. 7, pt. 3.



failure of retention results from difficulty in evocation of engrams, i. e., difficulty in recall on account of poverty of associations. I have suggested that the disorientation of a patient with Korsakoff's psychosis may result, according to Bartlett's analysis, from failure to extract images. But one must also agree with Meggendorfer that there is actually a defect of pure retention in any severe amnesic syndrome of the Korsakoff type.

(c) *Recall*.—This should be differentiated as denoting two processes of different complexity: (1) simple mechanical or sensorimotor recall, or reflex recall, and (2) recall involving voluntary effort and often proceeding along associative lines.

That recall of the second, more complex, type should fail first, before retention fails, is to be expected. This type of recall admittedly, by definition, involves the highest form of mental activity, i. e., voluntary effort, which is an activity of the ego, in contrast to the mechanical or sensorimotor type, which presupposes retention and occurs in accordance with the stimulus-response pattern so much beloved by behaviorists. This distinction seems to be confirmed not only by the experience with Korsakoff's psychosis but by the much commoner experience of fatigue or early senile loss. In both these instances, recall, for example of a proper name, may elude the subject's efforts, but recognition is readily possible. It is suggested, therefore, that in the mildest degrees of memory defect, i. e., of difficulty in remembering, it is recall that fails first, and retention usually later. To regard the process of voluntary recall as a function of a high level is also in accord with the data of psychogenic amnesia, which appears to be concerned almost exclusively with interference with the process of recall.

Epilepsy also furnishes examples of a failure of recall which gives the appearance of retention defect. It has been found by MacCurdy<sup>9</sup> in persons with epileptic dementia that with effort, if the patient can be induced to make it, the capacity for remembering is much greater than formal tests would at first lead one to suppose. Nevertheless, retention is a function susceptible to physical interference. I have seen retention defect as a very early symptom of tumor of the brain. Capacity to remember a short series of digits was lacking immediately after they had been given to the patient; there was no apparent recognition when they were re-presented.

Similarly, when the patient is mildly under the influence of an anesthetic but is not yet stuporous, he can still carry on a conversation. This shows that registration and some immediate retention occur, but there may be no subsequent remembering or recognition when the facts

9. MacCurdy, J. T.: *Psychiatric Bull.* 9:187, 1916.

are afterward described to the patient. Even here, however, the presumption that retention rather than recall is affected by physical factors may be too readily made, as is illustrated by the following remarkable case that was described to me by Dr. I. G. Robin. The patient was under the care of Dr. A. F. Hurst, at Guy's Hospital.

A. C., a man aged 49, who was admitted on May 15, 1934, had at 1 p. m. on the day of admission been about to board a tram-car to go home for lunch, when he "fainted." The next thing he remembered was being in his own house, which was a ten minute ride away. His face was cut, and he had a torn coat. There was complete amnesia for that period—about fifteen minutes. There was no biting of the tongue, no headache at the time, no aura and no vomiting. The wife, when interrogated, said that there had been no evidence of any recent change in behavior. The patient's mentality was normal. The history of previous health was not important.

The patient was seen at about 8 p. m., when he was feeling well except for a slight headache in the occipital region.

*Examination.*—The patient appeared well. The pulse rate was 60, the temperature 98 F. and the blood pressure 140 systolic and 90.5 diastolic. The central nervous system was normal except that the pupils were irregular. The plantar reflexes were indefinite.

*Laboratory Data.*—The Wassermann reaction of the blood was negative. The first examination of the cerebrospinal fluid (May 17) revealed: Lange curve 0001100000, pressure 250 mm., chlorides 780 mg. per hundred cubic centimeters and proteins 0.04 mg. A second examination, eight days later, revealed: pressure 180 mm., chlorides 760 mg., proteins 0.025 mg. and a Lange curve 001210000.

*Course.*—On May 19 the patient was hypnotized. (He was not deeply under hypnosis, and no posthypnotic suggestions were carried.) On interrogation he stated that he remembered crossing the road to board the tram, when the front wing of a lorry "hit" him and he fell, striking his head against the tram. He picked himself up and boarded the tram; the lorry driver asked if he was all right, and the patient said "yes"; the driver did not give his name or address and has not been traced. The patient sat in the downstairs part of the car, as he always did, paid his penny fare, remembered telling the conductor that he was all right and eventually left the tram at the right stop; he then proceeded to the door of his house, about a minute's walk away. He had to hold his handkerchief to his forehead on account of the hemorrhage. Since he was holding this with his right hand, he could not reach into the pocket in which was his door key; he therefore knocked at the door; his wife let him in. She remarked on his wound and on the fact of his knocking at the door.

The patient's wife persuaded him to come to the hospital because of the "fainting fit."

The patient was allowed to recover from the hypnosis. He still remembered the facts just stated—which he had not been able to do before the hypnosis.

The patient was discharged on May 30, with complete memory and in good health.

If these facts can be accepted as complete (and nothing emerged to suggest that this was a psychogenic amnesia), this is a case in which

trauma to the brain produced a failure of memory which masqueraded as a defect of retention. Retention was, in fact, unimpaired, as was proved by the recovery of details with the patient under hypnosis. The trouble was inhibition of recall. Furthermore, there is the interesting spectacle of a psychologic process reversing a physically induced inhibition.

(d) *Time Ordering of Experience*.—One of the primary mental functions is to infuse experience with a sense of time. This private time is, of course, different from conventional time and has no direct connection with it. Its fundamental characteristic is a sense of time as a simple appreciation not of duration but of something that continuously elapses. It gives a background for other experiences and so, secondarily, comes to be responsible for sequences. There is a primary ordering of experience. The pictures stamp themselves on the unrolling time film, independent of their content.

On the basis of a conception such as this, van der Horst<sup>10</sup> advanced an ingenious explanation of the failure of the patient with a Korsakoff psychosis to remember. He suggested that in Korsakoff's psychosis the memory defect is the result not of failure of immediate reproduction (which he declared to be often unimpaired) but of the loss of the "temporal sign" of experiences. For example, one of his patients, when given a cigar and asked about it a quarter of an hour later, replied: "I *have* had a cigar, but it was last week." In van der Horst's view, the temporal sign of a personal event depends on the time order of experience in the continuum of one's individual life, and in Korsakoff's psychosis this continuity of experience is no longer felt. In answer to the question "How long have we been talking?" the patient with Korsakoff's psychosis answers at random, although he may remember well the entire content of the conversation. Van der Horst stated that if time order is lost for current experiences the feeling for the need of it in regard to past experiences will soon be lost also—hence, also, the retrograde amnesia of Korsakoff's psychosis.

(e) *Pastness*.—I suggest that there exists as an independent function a feeling of pastness, the existence of which may be demonstrated from two kinds of experience: the feeling of *déjà vu* associated with some epileptic attacks and such an experience as that of a patient of mine who each time that she underwent an experience felt that she had a dream and that the dream, although not recollected, was the same as she had had on the previous occasion. The feeling of recapitulation of something that had happened previously was distinct and independent

10. van der Horst, N.: Ueber die Psychologie des Korsakowsyndroms, *Monatschr. f. Psychiat. u. Neurol.* **83**:65 (July) 1932.

apparently of the content, or at least of any conscious recollection of it.<sup>11</sup> The feeling of pastness seems therefore a distinct and isolatable experience; it is likely that loss of the capacity for it could have an effect on the total experience of remembering.

(f) *Associative Functions*.—Amnesia from lack of associative organization should be exhibited in the simplest form in early degenerative diseases of the brain, especially in the most slowly progressive types, e. g., those of senility before mechanical memory is demonstrably impaired. How far the forgetting of early senile dementia is due to restriction of interests and appetites, and how far to actual decay of the neuron organization that presumably underlies associative memory, is a matter for speculation. In amnesias of psychologic origin the tendency is for topics associated with the pathogenic memory to be forgotten.

(g) *Imagery*.—This has already been discussed under Bartlett's schemata (page 748).

(h) *Personal Identity*.—Cases of massive amnesia in which all personal data are included are not uncommon. The patient professes amnesia not only for the events of his previous life but for all personal data, including even his own name. Nevertheless, as a rule, the automatized functions, such as the educated use of words, are completely retained. Commonly also, the social habits of an adult are also retained. (In a few cases of so-called hysterical puerilism learned habitual reactions of all kinds are also lost.)

An example of this sort was furnished by a man, apparently about 25, who was brought to the hospital by the police, having been found wandering in a London street, unable to say who he was or where he came from. He looked somewhat pale and anxious and answered all questions readily and to the point, but all that he could remember was a Latin motto and the face of a rather stern-looking man with a stubby moustache. He spoke in an educated fashion but could give no account of where he had been brought up, or indeed of anything up to the moment, a few hours before, when he had found himself in the street. With reassurance and persistent persuasion, his memory of the journey that had brought him to London was, bit by bit, brought back, till suddenly one night, at about 3 a. m., everything he had forgotten was remembered. It was then learned that he had come from a northern town, that he was in business with his father, with whom he had quarreled, principally on account of his drinking habits, and that his sudden journey to London had begun on the evening of the day of the quarrel, just after he had seen his fiancée to her home. He had had some notion of going over to the Continent, but when he reached Victoria Station he found that he had insufficient money. It then dawned on him that he was behaving foolishly. He suddenly felt confused, could not think and could not even give his name to a policeman whom he approached

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11. It has been suggested by Lewis<sup>3</sup> that the *déjà vu* experience is due to "a failure to actualize the present." How the pure absence of something can account for the positive experience of *déjà vu* is difficult to understand.



after he began to feel "mixed up" in his head. In this instance, the complex actuating first the fugue and then the loss of memory was apparent. The "stern-looking man" turned out to be his father. The Latin motto was that of the university of his native city. A reconciliation was effected in the hospital, and the patient went home to his father's house, apparently well.<sup>11a</sup>

The important points in this case are: (1) the almost complete loss of memory for the events of life and even for the simplest personal data, in a setting of complete preservation of an adult personality with educated speech and action, i. e., with preservation of the automatized functions; (2) the retention of two isolated pieces of data, one of which was closely related to the precipitating situation; (3) the precipitation of the condition by an acute psychologic upset, and (4) the sudden recall of all the missing data, including those of personal identity.

A patient under my care at Guy's Hospital presented some unusual features. The loss of personal memory had persisted for three years, and a localized personal memory, for these three years only, had been built up subsequently, while all the previous data for the first forty odd years of his life had disappeared. When under mild narcosis induced with sodium n-methyl cyclohexenyl-methylmalonylurea by Dr. M. Campbell and Dr. C. H. Rogerson, the patient reenacted a war scene in which he identified those around him with soldiers. Subsequently, on gradual emergence from the narcosis, he recollected all his previous life.

The impressive points regarding this patient were: (1) the supersession of all the previous history and personal data by those of a period extending over three years only—identity being formally but not originally preserved by social constraint, as it were, since his relatives and friends continued to recognize him as the same man as before; (2) the absence of a discoverable precipitating conflict but the suggestion from the dramatic events elicited during narcosis that it was connected with the war; (3) the failure of persuasion to restore recollection, and (4) the restoration of memory during emergence from a narcotic condition.

This case makes an interesting corollary to that of Hurst and Robin, in which a psychologic process (hypnosis) undid a physically produced inhibition of recall. Here, in the case of Campbell and Rogerson, is a physiologic process (narcosis) undoing a presumably psychologically produced inhibition.

Such cases do not demonstrate the existence of a discrete factor for personal identity, apart from the recollection of events, as a component in the total process of remembering. This sense of personal identity

11a. Gillespie, R. D.: *Mind in Daily Life*, London, Methuen & Co., Ltd., 1933.



does not imply the judgment "I am the same person that . . ."; it is something elementary in which the immediate experience is felt. For more conclusive and not merely suggestive evidence for the existence of such a factor, one must turn to cases of depersonalization in which, although there is no forgetfulness, the recollected events lack the "emotion of belief" because they seem to belong to another existence or even to a different personality.

A sense of personal identity is therefore evidently not essential to mere recollection but is a distinct function, not emergent simply from the aggregation of other elements. It is a part of the complete experience of remembering, when the latter is considered in the full sense of a function of the highest level of the integrated healthy organism.

Abeles and Schilder<sup>12</sup> recorded cases of amnesia with loss of personal identity in a wide variety of syndromes—a schizophrenic psychosis, manic-depressive psychosis and various organic diseases of the brain (trauma to the head, arteriosclerosis and carbon monoxide poisoning) and malingering.

A case of Abeles and Schilder (one of fugue and amnesia in a man with arteriosclerotic disease of the brain) reminds one of the intimate relationship between events of the physical and those of the psychologic order in remembering. It is conceivable that the presence of an arteriosclerotic disease of the brain had produced such an impairment of the total psychophysical integration, or, in other words, such a deterioration of the personality, that a psychogenic fugue with subsequent amnesia occurred more readily than could otherwise have been possible. But this is different from saying that the organic disease produced the fugue and the subsequent amnesia. A direct cause and effect relationship between organic disease of the brain and fugue with amnesia must, nevertheless, be considered a possibility. I remember a patient of Dr. C. P. Symonds who had suffered from fugues with subsequent amnesia and in whom I failed to elicit psychologic factors (although, of course, negative results were not conclusive in those circumstances). It may be supposed that the inflammatory process in the brain had produced a disturbance of the physiologic substrata of the psychic process, such as occurs in epilepsy with automatism, and that the amnesia depended on a real failure of retention from the disturbance of cerebral conditions at the time. It is not wise, however, to assume too readily that in such instances the physical factor is the significant one.

In a case reported by Abeles and Schilder amnesia following trauma to the head was at first attributed entirely to trauma, but recurrences of amnesia (this time without the intervention of another trauma) led to

12. Abeles, Milton, and Schilder, Paul: Psychogenic Loss of Personal Identity: Amnesia, *Arch. Neurol. & Psychiat.* **34**:587 (Sept.) 1935.

the discovery of an important psychologic factor which had been operating all the time. Similarly, a tabetic patient I examined had experienced a fugue with subsequent amnesia, but neither the fugue nor the amnesia had anything to do with the underlying neurologic disease. A real emotional difficulty was the releasing factor.

#### SHORTCOMINGS OF CLINICAL TESTS OF MEMORY

An obvious deduction from the preceding considerations, as a whole, is that the ordinary clinical tests of memory are unsatisfactory in scope. It is not to be wondered at that they often fail to lay bare the earlier stages or the mildest degree of failure in remembering. They test either a lower level of function, that of mechanical memory, or the retention of well organized data. Neither type of test has much bearing on the most complex forms of remembering in their most recent instances—hence, the unsatisfactory nature of such tests and the greater reliability of evidence obtained from the every day life of the patient.

#### PSYCHOLOGIC FACTORS CONCERNED IN AMNESIA

If one assumes that registration and retention have occurred, the processes that are involved in inhibition of remembering must necessarily be concerned mainly with inhibition of recall. Recall, as has been suggested, may be side-tracked for physiologic reasons, or it may apparently be blocked, as in epileptic dementia. But the commonest mode of inhibition of recall is certainly psychologic, the process being known as repression. It has always been difficult to know precisely how repression occurs. Freud<sup>13</sup> first demonstrated the importance of the process of active forgetting in a figurative way: In repression "the impulse retains its energy but no memory is left behind."

I suggest that not all amnesias are due to either simple fading or active forgetting (repression). There are other possible sources of amnesia for experiences still retained. Early mental events take place proportionately more often, for example, in visual terms, according to the evidence of recollection in psychologic analysis. More important, the schemata of the early years of infantile life and childhood are different from those of a later age. A breast is remembered not as such but as a large globular object, perhaps with softness and satisfaction associated.

Translation into the new schemata will not occur unless there is some contemporary interest in making such a translation, i. e., not because repression is at work but because there is no biologic need. Verbalization especially, which is one of the most important forms of

13. Freud, Sigmund: *Introductory Lectures on Psycho-Analysis*, English translation by Joan Rivière, London, Allen & Urwin, 1922.

this translation, may never occur. The infantile satisfactions are private; there is no need to communicate the delights of suckling.

Emotional events are likely to be intrinsically difficult to recall, whatever their nature, for several reasons. They are not translated at an early age into metaphor or words of any kind; moreover, emotional states are excessively difficult to recapture. Regarding the process of repression itself, Fenichel<sup>14</sup> said: "Inhibition and repression are two aspects of one and the same psychologic process." They are different words for the same thing. It is agreed that repression is not a voluntary act. This was illustrated by a patient of mine in whom a particular act of forgetting took place under experimental conditions. The incident is worth recording, for the actual observation of the occurrence of an act of repression appears to be rare.

I showed the patient five objects simultaneously—a pen, a pocketbook, an inkstand, a paper clip and a pencil—and after a brief exposure I asked her to name the objects she had seen. This she did easily. On presenting the same group of objects, with a box substituted for the paper clip, I was surprised to find (for I was carrying out this experiment for another purpose) that she then could not name one of the objects. On being asked for an explanation of this curious phenomenon, she said, by the way, that she felt something had taken the memory of all the objects out of her mind. It was found that the box reminded her of a peculiarly unpleasant group of ideas (a complex the emotional tone of which was one of disgust) of a closely personal sort. The unpleasant nature of the associations with the word "box" was evidently responsible for the immediate forgetting of all the other associated objects.

It appeared that the repressing agent worked automatically: The original repressive agent was stimulated again into activity. The nature of the previously repressed material was such as to suggest that the repressing agent was of the type described by Freud as the "super-ego."

Amnesia from repression may depend on one of three processes:

1. The automatic operation of the superego, as in the foregoing instance, which occurs mainly in early life. Voluntary recall is impossible.

2. The operation of the ego itself. It appears that any experience the emotional content of which is such as to threaten self-preservation or some very valued function, such as vision, may be unendurable and that the ego seems to protect itself by repressing the memory of the experience, i. e., by failure to remember it. An example of this type of forgetting was furnished by a youthful murderer I saw, who after recounting all the incidents of the murder forgot the whole

14. Fenichel, Otto: *Outline of Clinical Psychoanalysis*, translated by Bertram D. Lewis and Gregory Zilboorg. London, George Routledge & Sons, Ltd., 1934.

episode, including his own story about it, although he sought not to escape responsibility but rather to shield his accomplice.

3. The conflict of wishes, as in the forgetting of an appointment, in which a kind of reciprocal inhibition is possible, and that wish usually wins which is more in accord with the egotistic interests. Voluntary recall is possible. This type of amnesia is the commonest in every-day life.

Amnesia may be classified on a psychogenic basis as affective, hysterical and simulated. One may distinguish an affective type of amnesia from a hysterical type. Affective amnesia may occur when the ego is threatened (type 2). For example, if a person goes through the experience of an earthquake and is subsequently found to be amnesic, I should classify his amnesia as affective. The amnesia would depend entirely on the emotional shock and would be without a discoverable motive, other than to protect consciousness from painful memories.

Hysterical amnesia, properly so called, involves something different. It involves a concept of forgetfulness as a symptom, just as a patient may have a concept of paralysis or of anesthesia. He would persuade himself and the onlookers that he could not remember, and this failure of memory would follow certain lines, just as the anesthesia would belong to the glove, stocking or midline pattern. Hence, the particular characteristics of the amnesia would depend, first, on what he had heard or read and, second, on the method by which he was examined.

Hysterical amnesia has a motive, but the motive may sometimes be far to seek, since it often depends on inner difficulties. The motive is not merely protective from a painful memory, as in the affective type of amnesia. Hysterical amnesia belongs, with elaborations due to the personality of the hysterical patient, to type 2. (I am using hysteria in the original clinically descriptive fashion and not as denoting any particular variety of mental process.)

*Differentiation of Hysterical and Simulated Amnesia.*—The third type of psychogenic amnesia, that due to simulation, is exceedingly difficult to differentiate clinically from hysterical amnesia. The reason for this difficulty is simple. Hysteria and simulation are the same from the symptomatic standpoint, but the reasons for their occurrence are of a different order. In hysteria the patient simulates from inner needs. He knows, at least at the beginning, that he is simulating, but he does not know why. He may realize that he wants sympathy. In simulation the patient does it to evade crude external difficulties of a contemporary kind of which he is perfectly aware. The inner needs of the hysterical patient, on the other hand, are narcissistic and infantile. The narcissism gives him a tendency to self-display, which readily

utilizes dramatic possibilities. The motive in simulation may also, indeed, be regarded as protective, but it is protective from consequences and not from memories, or in the case of compensation it is for the sake of consequences.

I suggest that all the grosser symptomatic manifestations of hysteria are the joint manufacture of the patient and the too credulous physician and that study of these gross symptoms has served only to obscure understanding of the underlying mental constitution. It is true that after a time the patient may himself come to believe in the amnesia. As a patient of mine once said: "There is a moment of conscious acceptance of the neurosis." After that, the patient believes more or less in his amnesia until some one with a strong conviction to the contrary persuades him to look again toward the memories from which he is turning away.

Since both hysterical and malingered amnesias are consciously simulated—the former at least at first—they follow the patient's concept of what amnesia should be in both instances, and there will be no distinction between the two types. Any difference between hysterical and malingered amnesia will be individual, depending on the individual patient's experience and not varying in any general way in its characteristics as between hysteria, on the one hand, and malingering, on the other. I should regard as almost certainly malingered an amnesia arising without physical cause in a patient who is up against a well known material difficulty, such as an accusation of embezzlement. The differential diagnosis between an organic and a psychogenic amnesia depends, of course, on the nature of the etiologic factor, if it can be discovered—whether it is psychologic or physical. This may involve all the diagnostic means available, from a careful history to an encephalogram and a lumbar puncture.

The type of the amnesia itself is of prime importance. If it is associated with complete intellectual capacity from its beginning, i. e., if it is without any impairment of consciousness at any time, it is probably psychogenic. If it is arbitrarily selective, inconvenient events being forgotten, it is psychogenic.

The type of recovery is almost equally significant. If this is sudden and complete, it is probably psychogenic. If it occurs by a gradual rolling up of the amnesia in an orderly fashion, it is probably due to cerebral disorder.

The extent of the amnesia—at least as far as the forms of acute onset are concerned—should be carefully investigated. It was observed by Russell<sup>15</sup> in two hundred cases that the longest period for which

15. Russell, W. R.: Amnesia Following Head Injuries, *Lancet* 2:762 (Oct. 5) 1935.



the patient had a retrograde amnesia subsequent to trauma to the head was seven days. Anything longer than that in the way of amnesia of sudden onset is suspected of being of psychologic origin.

It is sometimes disputed in a court of law whether complicated activity of a type that would pass as normal to the onlooker is possible during a state of disordered consciousness following injury to the head. It is interesting to cite the experience of Winterstein and Guttman,<sup>16</sup> who have recently investigated at Guy's Hospital the psychologic and the neurologic state of professional boxers. They have collected a number of instances of amnesia in boxers following a knock-out. Some have remembered the sensations in the body after the punch. Others cannot remember feeling the punch but remember having seen it. Others do not remember anything of the punch. In these cases the knock-out was complete, and the boxer remained inactive until, after a short time, memory came back gradually. But there is a second group in which the amnesia extends in retrograde fashion, from the time unconsciousness became complete. During the time which elapses between receiving the blow and the ultimate unconsciousness, the boxer is apparently capable of behaving as if he were fully conscious. Cases are on record of boxers who have been allowed to fight on and have, in some instances, won the fight, who had received a heavy punch earlier in the proceedings and had no memory of the fight from the time the punch was received. A well known boxer, when 15 years old, was caught by a punch on the chin in the first round of a fight. He went down for a short count. He regained his memory under a cold shower. He had to find out carefully what had happened. He heard that he had fought like a tiger and won through a technical knock-out in the third round. Since the fight was won ultimately, there would be, as Winterstein and Guttman pointed out, no motive for forgetting it.

The automatic activity of epilepsy with subsequent amnesia is celebrated and is commonly reputed to be capable of reaching a high level, although the activity that takes place is held to be marked by impulsiveness and lack of apparent purpose. This, if true, is in contrast to the condition of boxers who proceed to win their fight, i. e., display a high degree of purposive activity while in a state of disturbed consciousness following a blow which ultimately produced amnesia. This observation suggests that in epilepsy also there may be purposive activity relating to the ordinary life and that purposelessness is not an essential and indispensable mark of an act of automatism.

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16. Winterstein, C. E., and Guttman, L. E.: Personal communication to the author.

## SUMMARY

1. Remembering, in the full sense of the word, i. e., as an activity of the fully integrated organism, involves a complexity of component functions. The disintegrative processes of disease allow a number of these components to become manifest. (But one must make the reservation that what is made evident by disease may be entirely morbid and not a part of the original total process.)

2. A sensorimotor type of memory is contrasted with personal memory. That it is an activity at a lower level of integration is suggested by the experience of a disease such as the Korsakoff psychosis. The ordinary clinical tests are unsatisfactory.

3. Recall is not a uniform process but may occur either at the sensorimotor level or as a fully voluntary act. As the latter, it may be side-tracked in physical disease of the brain, or it may be blocked. A case is cited in which an apparently physically produced inhibition of recall was restored by psychologic means (hypnosis). Failure of recall is often mistaken for failure of retention.

4. The time ordering of experience may be a primary mental function, and loss of it may explain some defect in an amnesic symptom complex, such as Korsakoff's.

5. A feeling of pastness is suggested as a component function in remembering.

6. The "emotion of belief" (Russell<sup>4</sup>) is an essential attribute of memory. It is composed of the feeling of pastness and the sense of personal identity.

7. Psychogenic amnesia is dependent mainly on failure of recall. Inhibition of recall may result from the activity of the ego itself, either as self-protection from the memory of experiences of shock intensity or as the result of a conflict of wishes. Inhibition of recall may also be the result of the operation of the superego, acting on experience, real or fantasied, embodying a feeling of guilt. The automatic occurrence of an act of forgetting under experimental conditions is described.

8. Gross amnesia of the hysterical type is clinically not distinguishable, by mere inspection alone, from simulated amnesia, since both depend on the individual patient's idea of what amnesia should be. Hysterical amnesia is held to be a conscious simulation for inner needs, while malingered amnesia is simulated for some occasional material advantage.

9. From a medicolegal standpoint the following observations are important:

- (a) Hysterical amnesia often begins at the end of a fugue, consciousness having been maintained up till that time.

- (b) When consciousness has been disturbed by a trauma to the head for a period for which there is subsequent amnesia, a high grade type of performance has been demonstrated to be possible during the time for which there is subsequent amnesia.
- (c) Retrograde amnesia may occur after epileptic attacks and may stretch back long before the time when consciousness was disturbed by the epileptic seizure itself.<sup>17</sup>
- (d) Amnesia for criminal acts is not to be accepted as anything but malingered (in the absence of physical disease of the brain) unless it conforms to the type described as resulting from experience of shock intensity.

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17. Steinmann, Inge: Ueber protrahierte Amnesien bei echter Epilepsie, *Ztschr f. d. ges. Neurol. u. Psychiat.* **148**:211, 1933.

## PSYCHIATRY IN CHINA

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PEIPING, CHINA

The career of Adolf Meyer has been built largely in an adopted country. His influence has continued to travel. Some changes may have occurred in his teachings when they were carried to other countries, but that does not break their claim to inheritance from him. In China the growth of certain aspects of the development of psychiatry must resemble stages in the growth of psychiatry observed by him in America, such as the period of police control prior to that of cooperation between the city and the medical school. But it is the difference between the Chinese and the American situation which offers the more interesting possibilities of comparison. The comments made in this communication are based on five years' experience in China and carry the expectation that tendencies now in progress will probably not turn out to be mere repetitions of American psychiatric history.

There is no doubt that mental disorder exists in China. In cities, such as Shanghai, Nanking, Changsha, Canton and Peiping, many patients with mental diseases have come to clinics. The police have segregated some persons in "asylums" for such reasons as, for example in Peiping, "being a public nuisance or danger to others, acting queerly on the street or behaving as any other offender in the eyes of the police." Other persons with mental complaints have often been treated by old-fashioned Chinese-trained physicians by needling, Chinese medicines, and various forms of suggestion, exorcism or shock, depending on the local customs. The language of the country abounds in words such as insane person (*feng-jen*), confusion (*hu-tu*), excitement (*fa-feng*) and worried depression (*men-ch'i*). There are familiar examples of mental disturbance or even more of its simulation in the literature (e. g., Yü Jang, Sun Pin and Lin Tai Yü) and in history (e. g., Li Po and Chu Yuan). There are even a few actors (e. g., Tan Chinpei in the rôle of Fan Chung-yü and Mei Lan-fang as Miss Chao) whose reputation rests in part on their portrayal of insanity on the stage. However, the incidence of mental disease in China cannot be given with any reliability or even estimated. No surveys have been made from this standpoint in communities. At present it is possible only to give such distributions as the number of cases of dementia

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paralytica (53) among all patients with a positive Wassermann reaction<sup>1</sup> (1,945) or the number of cases of delirium tremens (none) among all those with a history of alcoholism<sup>2</sup> (11) in an institution in a given period; even this information deals with such selected groups of persons that one hesitates to accept these proportions as existent in the community at large. Also a serious difficulty in determining the incidence of mental disease lies in the definition of mental disease in China. The differences between Western and Chinese conditions make it impossible to apply equally to East and West any common measures of maladjustment in terms of satisfaction or dissatisfaction, happiness or unhappiness, etc. Frank psychoses are easily recognizable, but they taper off through various forms of catastrophic or other reactions into neuroses, and these merge with behavior which is regarded as normal or expected by other persons living under the same circumstances and traditions. Viewed as a whole, the criterion of success or failure in meeting the social situation, of adaptation to the structure of the group, stands out more prominently here, in contrast to the accent on emotional conflicts within the individual in the West. This represents a difference of attitude and emphasis, not of fundamental mechanism, but it conceals the number of patients with mental disease and is one of the factors which keeps them from seeking the physician.

There has not been an indigenous psychiatry in China in spite of the old civilization of this nation. This implies that disorders of behavior have been absorbed by other agencies, chiefly the family. Throughout the countryside, which contains the bulk of the population, and also among many city dwellers who have not made too complete or abrupt a change of old ways for new, the family is capable of successfully taking great responsibility for the behavior and welfare of its members. This is recognized on all sides. Patients have often been released from the Municipal Psychopathic Hospital in Peiping by the police at the request of the family, although this may be strongly against the advice of the physician. Sometimes it has turned out well, sometimes not. Questions as to what the families do and how humane they are in dealing with neurotic or psychotic relatives bring a wide variety of answers, some crude and others extremely considerate. Other social agencies doubtless have a controlling influence on behavior—the force of group opinion, the organization of work, guilds, a system of shop guarantees, the police and the Bureau of Public Safety, the old-fashioned Chinese physician and places of refuge, such as Buddhist temples and Catholic institutions. These have taken care of mental

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1. From the Peiping Union Medical College, July 1, 1933, to June 30, 1935.

2. From the Peiping Municipal Psychopathic Hospital, October 1935 to October 1936.



disorders in the past, and the questions can be raised whether these existing conditions could be effectively changed now and whether any attempt should be made at the present time for psychiatry to push into the scene with the large majority of the population, which lives according to the dictates of these social influences. In my opinion, "No—at least not yet."

There is left to consider a smaller but important group of persons, who have turned to new ways of life, modern programs and more or less revolt against many old customs and who are represented typically by the student bodies in the Chinese universities. They have become familiar with Western ideas and have become "emancipated" from the tight control of the older social agencies, in some cases including the family. They are exposed to added stresses and have lost some of the older protections. In this group are persons whose emotional difficulties have come to the notice of "enlightened" friends or teachers. Now some of those in difficulty are beginning to be referred to the psychiatrist. At the same time friendly relations have been established, at least in Peiping, between the neuropsychiatrists and the psychologic and sociologic faculties in nearby universities. This direction seems to point to the outstanding opportunity for psychiatry in China, dealing largely with relatively hopeful situations among the youth, many of whom will take part in the reconstruction of this country.

An opportunity of second importance for the development of psychiatry lies in the hospitals themselves. There are only a few in China which are exclusively for patients with mental disease. In 1873 Dr. John G. Kerr founded a psychiatric clinic in Canton, out of which grew a hospital for the insane. Later the city of Canton established another hospital for patients with mental disease. In the political trouble in 1927, the city arranged to take over the buildings of the Kerr hospital, and it has recently bought the land on which they stood from the Presbyterian Mission. The reorganization of this combined institution, caring for about 800 patients, is now being planned under the direction of Dr. Wu, who was trained in Germany. In Manchuria there have been rather extensive accommodations for patients with mental disease in two hospitals in Harbin and in one in Mukden under Russian influence. They have continued since the Japanese invasion of 1931. In Mukden the teaching and hospital arrangements for patients with mental disease have come entirely into the hands of the Japanese. From the report prepared for the League of Nations in 1933, it seems that psychiatric facilities and personnel in Manchuria, later Manchukuo, were distinctly superior to those in China proper. In 1897 the Elizabeth Blake Hospital was founded in Soochow. It contains a section for neurology and psychiatry, in which there are now 110 beds. In Peiping,

the old asylum described by Schaltenbrand<sup>3</sup> was made into a municipal hospital in 1932, as a joint project carried out by the city government and the Peiping Union Medical College. It now has about 250 patients. But, along with treatment by such measures as fever therapy, protracted narcosis, psychotherapeutic interviews and occupational therapy for selected patients, there is still such a shortage of reliable personnel and of ordinary hospital facilities that many patients are merely kept under custody and chained when combative. In Shanghai the Mercy Hospital, a well equipped Catholic institution with 300 beds now filled by patients with mental disease and with room for further expansion, was opened in 1935. In Nanking, Changsha, Hankow and other places there is some teaching of neuropsychiatry, but the patients are admitted in limited numbers to the general medical service in the hospitals. During the last few years there has been increasing expression of appreciation for neuropsychiatric opinion about patients in several of these hospitals, but the therapeutic results have been considerably limited by the type of patients admitted to these institutions. In the Peiping Union Medical College the consultations requested by other clinical services provide many interesting problems, some of which have profited by the neuropsychiatric interviews.

The ability to make use of these opportunities to develop psychiatry is restricted, first by lack of personnel and second by the size of the budget. Neurology has attracted occasional physicians in the past, and now psychiatry, the Western specialty last to be recognized in China, has a few representatives trained according to Western standards. Fortunately there is no antagonism between neurology and psychiatry. Those who practice one also practice the other, but training in both lines is not yet sufficiently thorough. Only a few graduates from the medical schools elect neuropsychiatry, perhaps in view of the keen competition by all other branches of medicine for recent graduates. This paucity of medically trained personnel in psychiatry prevents rapid expansion of the movement, a fact which has compensations. One of these is the encouragement given to the training of nonmedical workers as a part of the psychiatric unit, which makes it possible for various related interests to grow up together. Nursing has a good start in Shanghai. In Peiping, psychology, sociology and social service are represented as recognized parts of the neuropsychiatric service. In general there are good spirit and friendly cooperation between the medical and nonmedical groups. Without glorifying the latter, it is nevertheless held out that psychology and sociology could have the same sort of relation to clinical psychiatry that physiology and biochemistry have

3. Schaltenbrand, G.: *Psychiatrie in Peking*, Ztschr. f. d. ges. Neurol. u. Psychiat. **137**:168, 1931.

recently had in their scientific contributions to internal medicine. It then remains for the neuropsychiatrist to integrate these contributions with the physical factors and to aim at a balanced perspective of the whole.

In those medical schools which make any serious attempt to teach neuropsychiatry, the courses are given in English. Some teaching in this subject may be introduced in Chinese in 1937 in Nanking by Dr. Ch'eng Yu-lin and in Changsha by Dr. Ling Min-yu. The use of foreign terms seems for the time being to be indispensable in neuropsychiatry, as in other branches of medicine, especially in connection with its anatomic and physiologic aspects. At the same time, with an eye to the future, it is not too early to start search for Chinese expressions of the more fundamental psychiatric concepts which fit the spirit of the language. The sooner this is done the better for their spread into the other medical schools, which still make little or no effort really to teach this subject. In graduate teaching, the fate of such names as dementia praecox must be explained, and the halos around conditioning, libido and even instinct must be outlined, but for Chinese undergraduate medical students basic principles can be presented in simple English terms and the challenge thrown out to construct psychiatry themselves from their own experiences and with their own language. Another pupil of Dr. Meyer, Dr. Robert P. K. Wang, has spent considerable time in the difficult task of providing official Chinese terminology for neuropsychiatry.

It was not until 1936 that any attempt was made in Peiping to learn the results of introductory courses in psychiatry.<sup>4</sup> On the whole, some interest has been expressed by a number of undergraduate students, but there has also been a good deal of criticism, on the grounds of vagueness, lack of scientific precision and difficulties in therapy. Former graduates have at times shown misunderstanding of the aims of psychiatry, but little if any actual antagonism has appeared. Among patients, a few ask for a foreign doctor; most prefer a Chinese psychiatrist; only a few Chinese patients object to a psychiatric approach to their situations. If properly approached, almost all these patients talk with great freedom about the most intimate matters, although it often takes time to bring the patient to see underlying significance of words and acts, which they tend to dismiss quickly at their face value. Resistance to psychiatric interviews might of course relate to the personality and technic of the psychiatrist, but it could also provide observations of interest about the psychology of the people. No attempt is made to push an analogy with resistance and transfer, as used by psycho-

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4. Before and after the courses, association tests were given and written statements were called for. Also individual interviews were held with some students at the end of a course.

analysts, but it seems likely that responsiveness or resistance to a new subject like psychiatry will have some general connection with the culture of the race. It is my impression, as yet unchecked by enough case histories, that resistance to the psychiatric interview is low rather than high among Chinese patients but that there is no special readiness to probe the unconscious for hidden motive and that several of those persons who have resisted such attempts are Western-trained Chinese, some of whom equate science to physics alone. Accordingly, the Chinese soil seems not to resist the growth of psychiatry, as has also proved to be the case in Japan, where there are at least two psychoanalytic societies at the present time.

In Peiping the program for this year is a continuation of previous work. In addition to the usual clinical duties and neuropathologic routine, an attempt is being made to study enough patients in sufficient detail to allow later analysis of the material. In the first place, a sociologist, Dr. Bingham Dai, and six social workers are collecting data on the environmental and cultural factors; eight physicians having some connection with the neuropsychiatric staff are responsible for physical examinations; five of these and six psychologists are making records of mental reactions, all on the same set of patients. The "mental status" of Adolf Meyer was taken as the basis for this series of examinations, but its original form has been considerably changed and in parts expanded, so as to include wherever possible psychometric and other experimental psychologic technic. From these data it seems possible that analysis could be made, isolating primary factors and denoting them with the symptoms which cluster around them as syndromes, objectively extracted from the test data.<sup>5</sup> With a less flexible technical procedure Moore<sup>6</sup> has already shown the possibility of determining general types of mental reaction in such a way. In the second place, a few selected cases are being studied more intensively with the hope that they may yield information about individual responses to psychoanalytic procedure, symbolism among the Chinese, conversions of effect in the face of family, political or other difficulties, etc. No definite conclusions from these studies can be drawn at present and probably not for some time in the future.

#### SUMMARY

Influences have been at work on several sides for some time, leading up to the development of psychiatry in China. Recently they have taken more definite shape in a few centers, where programs of work are

5. Thurstone, I. L.: *The Vectors of Mind*, Chicago, University of Chicago Press, 1935.

6. Moore, T. V.: The Empirical Determination of Certain Syndromes Underlying Praecox and Manic-Depressive Psychoses, *Am. J. Psychiat.* 9:719, 1930.

under way. This is a significant period for Chinese psychiatry, since the directions given to it now are likely to have especial importance in shaping its future. There is an opportunity\* to make effectual contacts with some of the young and progressive persons of potential value to their country, who are going through emotionally difficult times in striking a balance between old and new ideals. Hospitals for patients with mental disease lag behind Western standards, but at least they provide the chance to deal with some persons brought up under the old traditions, many of whom, however, are deteriorated, epileptic, delirious, brought in on various charges by police or too dangerous or difficult for their families to care for. The chief limitation is in trained personnel. This makes it desirable to concentrate on providing local demonstrations of the value of psychiatric work for a community and on keeping the cost low enough to allow them to be copied elsewhere in China. To be firmly established, psychiatry needs recognition and support by the government. There is already a National Mental Hygiene Association in Nanking, but the government cannot be expected to invest extensively in it until its worth has been demonstrated. The near future holds out the possibility that psychiatry will prove its value and be admitted to official standing in governmental medicine as well as in the medical schools in China. If so, it is hoped that psychiatrists will be prepared to collaborate actively with those carrying out the work in medicine, public health and the proposed developments in social medicine. Incidentally, neuropsychiatrists in China can collect and analyze data as a contribution to comparative racial psychiatry, in which social and cultural factors will probably play a large part.



# LATENCY OF CORTICAL AND RETINAL ACTION POTENTIALS INDUCED BY ILLUMINA- TION OF THE EYE

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In 1934 both Bartley<sup>1</sup> and I<sup>2</sup> reported the effect of intensity of light on the latency of action potentials in the visual cortex of the rabbit in response to photic stimulation of the eye. We demonstrated that the latency of the cortical potential varies inversely with the intensity of light and presented evidence to show that the latent period of the cortical potential varies according to that of the retinal potential. But we differed on one point: The latency as determined by me was considerably longer.

It seemed to me that the reason for this discrepancy might be sought in the difference either in the anesthetics used or in the methods of photostimulation employed. I used dial to anesthetize my rabbits, while Bartley narcotized his animals with magnesium sulfate, ether or amytal. Bartley stimulated the eyes of his rabbits with short exposures to a lighted lamp, while I did this by lighting a small flash-light bulb filled with gas.

Of these two explanations, the first was rendered improbable by the fact that with the same method of photostimulation of the eye I found little difference between the length of the latent period of the cortical and the retinal action potential in rabbits anesthetized with dial and that in animals under ethyl carbamate (urethane) narcosis.

In a series of experiments with rabbits under dial narcosis, I measured the latent period of the cortical potentials induced by the methods of both Bartley and myself. The eyes of the animals were stimulated first according to one of the two methods and then according to the other, the intensity of the stimulating light at the surface of the eye being kept constant at 475 meter-candles. I found that the cortical potential wave elicited by a short exposure to a lighted lamp had a much

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1. Bartley, S. H.: Relation of Intensity and Duration of Brief Retinal Stimulation by Light to the Electrical Response of the Optic Cortex of the Rabbit, *Am. J. Physiol.* **108**:397 (May) 1934.

2. Wang, G. H.: Action Potentials of the Visual Cortex and the Superior Colliculus Induced by Stimulation of the Retina with Light, *Chinese J. Physiol.* **8**:121 (May) 1934.

shorter latency (table) and a larger size. This result showed that the difference in the methods of photic excitation of the eye is responsible for the difference in the length of latency.

A sudden exposure to a lighted lamp gave the eye a short interval of stimulation, which reached full intensity immediately on uncovering the lamp. When the eye was stimulated by lighting a gas-filled lamp, it took some time to heat the filament and the surrounding gas before it began to glow and some time for the light to reach full intensity. In order to show these expected differences in time, I took oscillograms of the electric changes produced in a photo-electric cell by the two methods of photostimulation, using a Matthews oscillograph driven by a five stage resistance-capacity-coupled amplifier. The amplifier not being directly (battery) coupled, it could not reproduce the constant potential difference in the photo-electric cell caused by photic excitation but had a cal-

*Differences in the Latent Periods of Cortical Potentials in Response to Stimulation of the Eye by Short Exposure to a Lighted Lamp and by Lighting a Lamp\**

Rabbit No.	Methods of Stimulation	
	Lighting Lamp	Short Exposure to Lighted Lamp
228.....	114 (12)	41 (3)
229.....	122 (12)	34 (3)
230.....	125 (9)	50 (2)
232.....	119 (9)	43 (6)
233.....	134 (10)	38 (10)
234.....	138 (10)	41 (16)
Average.....	126	41

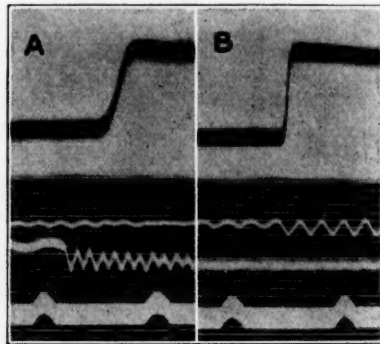
\* The length of latency is measured in milliseconds. Each figure is the average of the number of observations expressed by the figure in parentheses.

culated time constant (two-tenths second) adequate to register the expected differences in time. It is evident in figure *A* that the light started sixty-five milliseconds after the closing of the switch and reached its full strength forty-five milliseconds after starting the light, when the photo-electric cell was excited by lighting the lamp, and in figure *B* that full intensity of the light was attained in twenty-three milliseconds, when it was excited by exposure to the already lighted lamp. The final deflection of the oscillograph was practically the same in both cases.

The latency of the cortical potential elicited by lighting the lamp was, as shown in the table, one hundred and twenty-six milliseconds on the average and was about three times longer than that of the cortical wave called forth by uncovering the lamp already lighted. In the preceding paragraph it was shown that the lamp may be assumed to begin to glow sixty-five milliseconds after the closing of the switch and that this interval must be deducted from the observed latency. Even after the deduction of sixty-five milliseconds, the latent period of a

cortical potential in response to lighting the lamp was still about 50 per cent longer than that of the cortical potential induced by exposure to the same lamp already lighted. This difference may, it seems to me, be attributed to the difference in the rate of reaching full intensity. My unpublished observations on the retinal action potentials of decerebrate frogs called forth by an increase in the intensity of illumination have proved this assumption. The faster the rate of increase in intensity, the shorter the latent period of the retinal potential and the larger the size of the wave.

These differences in time in the methods of photostimulation also offer stimulation with an explanation of a fact observed by me,<sup>2</sup> that in stimulation with flickers the first flash of light shortens the latent period of the cortical and the retinal potential wave elicited by the subsequent flash. This observation is at variance with the results of earlier



Tracings showing the difference in the time required to reach full intensity (A) when a photo-electric cell is excited by lighting a lamp and (B) when it is excited by exposure to the same lamp already lighted. The intensity of light was the same in both cases (475 meter-candles).

The lower white line indicates time expressed in two-tenths second; the middle line, the closing of the switch in the lamp circuit, and the upper line, the moment of uncovering the already lighted lamp.

workers. I produced flickers not with a sectored revolving disk but simply by alternately putting on and off the light. When the lamp was relighted a very short time after it was put out, its filament and the surrounding gas were not entirely cooled, and therefore it required less time to heat again. Also, its light reached full intensity in a shorter time. The latency of the potential change evoked by the flash of light following the preceding one was much shorter.

I wish here to call attention to an important implication of my findings. They not merely offer an explanation of two previous observations, which differed from the results of other workers, but indicate the

importance of the rate of increase in light intensity in photic excitation of the retina. This factor seems, so far as I am aware, to have been neglected by investigators in the field of vision,<sup>3</sup> although the effect of the duration of illumination on retinal excitation has been thoroughly studied.

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3. Kohlrausch, A.: Die elektrische Erscheinungen am Auge, in Bethe, A.; von Bergmann, G.; Emden, G., and Ellinger, A.: *Handbuch der normalen und pathologischen Physiologie mit Berücksichtigung der experimentellen Pharmakologie*, Berlin, Julius Springer, 1931, vol. 12, p. 1393. Hecht, S.: Vision: II. The Nature of the Photoreceptor Process, in Murchison, C. A.: *Handbook of General Experimental Psychology*, Worcester, Mass., Clark University Press, 1934, p. 704. Graham, C. H.: Vision: III. Some Neural Correlations, *ibid.*, p. 829.

## CEREBRAL CIRCULATION

### XLV. VASODILATION IN THE PIA FOLLOWING STIMULATION OF THE GENICULATE GANGLION

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AND

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In a previous paper<sup>1</sup> it was shown that dilation of arteries in the pia following stimulation of certain "depressor" nerves was due to the fall in blood pressure and retarded blood flow through the brain brought about by the stimulation. There still remained the possibility that true dilator fibers might reach the pial arteries by some pathway other than that of the vagus and "depressor" nerves. Such a route had been indicated by the physiologic work of Penfield and of Cobb and Finesinger<sup>2</sup> and the anatomic work of Chorobski and Penfield.<sup>3</sup> A nerve pathway was traced by the last-mentioned authors (in monkeys) from the facial nerve through the geniculate ganglion to the great superficial petrosal nerve and thence to the internal carotid nerve. Stimulation of the facial nerve near its exit from the medulla (after section of the nerve proximally) or stimulation of the superficial petrosal nerve caused dilation of pial arteries, and this effect was observed in the ipsilateral hemisphere only.

The next step was to determine whether this reaction would occur in the absence of any fall in blood pressure, especially when the latter was at a normal (or high) level. In order to settle this point, it was necessary to make actual kymographic records of the blood pressure, for we had found that when the prestimulation pressure was lower than 80 mm. of mercury a fall of less than 10 mm. might cause dilation.

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From the Department of Neuropathology, the Harvard Medical School.

1. Forbes, H. S.; Nason, G. I., and Wortman, R. C.: Cerebral Circulation: XLIV. Vasodilation in the Pia Following Stimulation of the Vagus, Depressor and Carotid Sinus Nerves, *Arch. Neurol. & Psychiat.* **37**:334 (Feb.) 1937.

2. Cobb, S., and Finesinger, J. E.: Cerebral Circulation: XIX. The Vagal Pathway of Vasodilator Impulses, *Arch. Neurol. & Psychiat.* **28**:1243 (Dec.) 1932.

3. Chorobski, J., and Penfield, W.: Cerebral Vasodilator Nerves and Their Pathway from the Medulla Oblongata, *Arch. Neurol. & Psychiat.* **28**:1257 (Dec.) 1932.



Therefore, if one could secure accurate tracings showing a high pressure with no fall throughout the period of stimulation and yet obtain arterial dilation, such a reaction could be distinguished from the depressor type of response. Moreover, if vasomotor innervation was involved, the reaction should be abolished by cocaine applied locally to the arteries under observation.

#### METHOD

Exposure of the facial nerve in its canal, between the geniculate ganglion and the internal auditory meatus, was accomplished most successfully through the middle and the inner ear, after removal of a large part of the cochlea. The facial and the auditory nerves were cut just inside the meatus, and the facial nerve was stimulated by a unipolar electrode distal to the cut and close to the geniculate ganglion. The facial nerve was cut also just outside the stylomastoid foramen. Weak stimulation, with the induction coil at 12 or 13 cm., was generally employed. The method of observation through a cranial window over the posterior parietal region of the cortex and the method of obtaining records were the same as those described in the last paper, and the same anesthesia was employed.<sup>1</sup>

Twenty-six cats were used in these experiments. In six animals the facial nerve was exposed on each side of the head. In some instances, in order to prevent the blood pressure from falling during the stimulation, Ringer's solution or heparinized blood was injected into the abdominal aorta (through the superior mesenteric artery). This proved to be a satisfactory method of compensation. In other animals the initial level of the blood pressure was high, and it fell so little, if at all, that it was unnecessary to compensate.

#### RESULTS

Under these conditions we found that faradic stimulation of the left facial nerve at the geniculate ganglion causes prompt dilation of pial arteries, even when no fall in blood pressure occurs (figs. 1 and 2). The arteries dilated within from five to fifteen seconds of the beginning of the stimulation, reached their maximum size about twenty seconds later and slowly regained their original caliber. The latent period was fairly constant—usually ten (plus or minus two) seconds, and this helped to distinguish the reaction from dilation due to other causes.

In eight of the twenty-six animals of this series, either the blood pressure fell just far enough so that the depressor influence could not be excluded, or the latent period of the dilation was unduly prolonged. In these experiments the reaction was considered to be of doubtful significance. The remaining eighteen animals maintained a high blood pressure, and the preparation appeared to be satisfactory. In a few cases some of the pial arteries proved to be nonreactive, while others, a few millimeters away, reacted in characteristic fashion. In two animals no dilation of any artery was observed throughout the experiment. The characteristic, prompt reaction occurred in sixteen animals—89 per cent of this group.

We were able to confirm the earlier findings of Chorobski and Penfield,<sup>3</sup> that the reaction is ipsilateral, not bilateral; that is, it occurs in the left parietal region during stimulation of the left, but not of the right, facial nerve (fig. 3). This observation seems important, for it

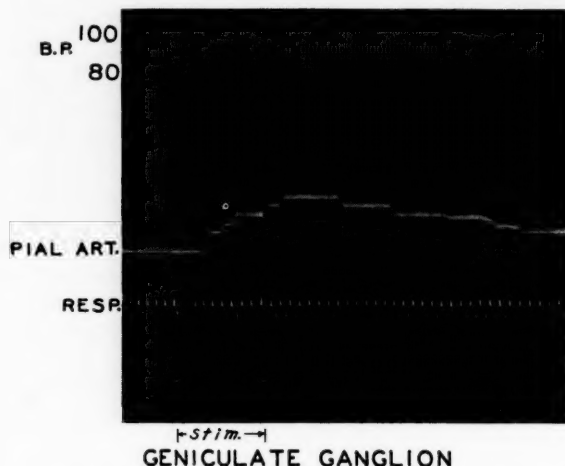


Fig. 1.—Stimulation of the ipsilateral geniculate ganglion (coil distance, 12 cm.). The pial artery was 270 microns in diameter and dilated 17 per cent. The blood pressure (femoral artery), at 94 mm. of mercury, did not fall during the stimulation.

In this figure and in the succeeding ones the signal line is at the bottom, and the two vertical lines indicate the period of stimulation. The time marker records five second intervals.

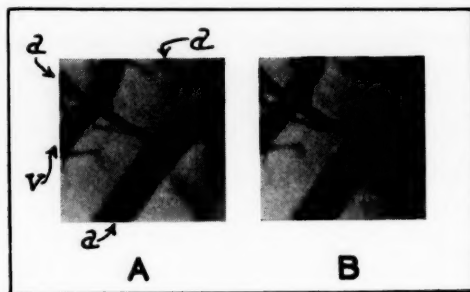


Fig. 2.—Photomicrographs of pial vessels taken with a Leica camera and Persenso film; objective,  $\times 10$ ; ocular,  $\times 9$ . *A* shows the control; *B* was taken five seconds after the stimulation of the ipsilateral geniculate ganglion (fifteen second stimulation; coil distance, 12 cm.). In the figure, *a* indicates arteries, the largest of which was 280 microns in diameter; *v*, a vein.

rules out many factors, such as fluctuations of systemic blood pressure or changes in blood chemistry (carbon dioxide, hormones, etc.). The effect of these changes, obviously, would be bilateral.

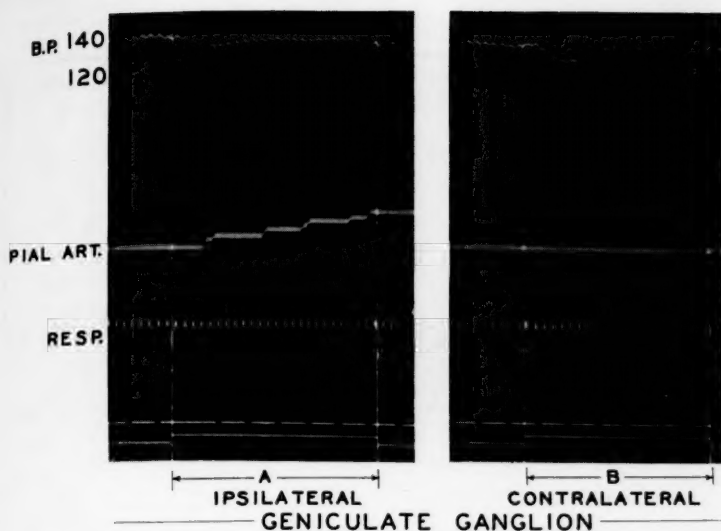


Fig. 3.—Ipsilateral geniculate ganglion: *A* indicates the period of stimulation (coil distance, 13 cm.). The pial artery, 180 microns in diameter, dilated 17 per cent. The blood pressure fell only 6 mm. and returned promptly to its original level.

Contralateral geniculate ganglion: *B* indicates the period of stimulation (coil distance, 13 cm.). The pial artery did not dilate. The blood pressure fell 10 mm. during the first fifteen seconds and returned to its original level before the stimulation had ended.

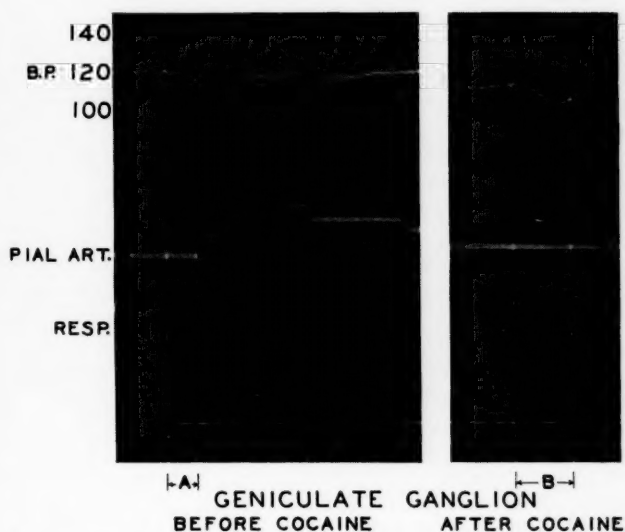


Fig. 4.—Stimulation of the geniculate ganglion, before and after the local application of cocaine. *A* indicates the period of stimulation before the cocaine was given (coil distance, 13 cm., at an angle of 15 degrees). The pial artery, 285 microns, dilated 13 per cent. The blood pressure fell little (6 mm.). The transient drop in blood pressure after the stimulation was associated with a deep inspiration.

Five-tenths cubic centimeter of a 1 per cent solution of cocaine hydrochloride was applied locally beneath the cranial window six minutes before the geniculate ganglion was stimulated at *B* (coil distance, 13 cm., at an angle of 15 degrees). The pial artery did not dilate. The blood pressure fell 12 mm.

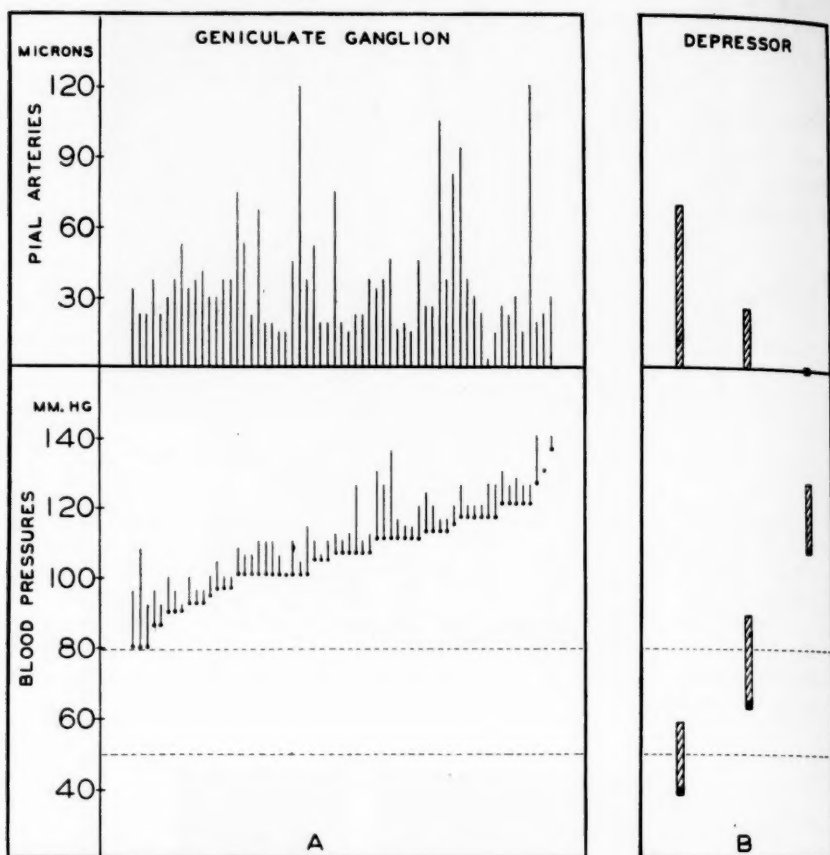


Fig. 5.—Chart showing the relation between the dilator responses of pial arteries and the height of blood pressure (*A*) during stimulation of the geniculate ganglion and (*B*) during stimulation of a typical "depressor" nerve.

In *A* each line in the lower group shows the amount of fall in blood pressure during a single stimulation. The lowest level reached in each experiment is stressed by a dot at the end of the line, and the experiments are arranged in ascending order according to these low points. Each upper line represents the increase in diameter of a pial artery corresponding to the level of blood pressure in the same experiment, recorded directly beneath. The results of sixty-one stimulations in the last ten cats of this series are shown in this chart. In all of these we have records obtained with the photokymograph.

*B* shows, for comparison, the response to central stimulation of the vagus nerve. The data were obtained from a series of ninety-nine experiments reported in our last paper.<sup>1</sup> The average fall of blood pressure and the average dilation were determined for three groups of fifteen experiments each. The first group was restricted to the experiments in which the blood pressure reached the lowest points; the second group occupied an intermediate position, and the third group contained the experiments in which the blood pressures were highest—comparable in height to those in *A*.

It will be seen at a glance that in *A* the dilations took place when the blood pressure remained above 80 mm. of mercury, whereas in *B*, under these conditions, the dilations were negligible. In *B* the dilations began to occur when the pressure fell to an intermediate zone between 80 and 50 mm. of mercury (indicated by the dotted horizontal lines) and were greatest below this region.

We discovered also that the reaction is completely abolished by a 1 per cent solution of cocaine hydrochloride irrigated locally over the pial arteries (fig. 4). This effect was noted in every instance (six animals) in which the trial was made. In sharp contrast to its paralyzing effect on the type of dilation due to stimulation of the facial nerve, cocaine had no effect on the type of dilation caused by a drop in blood pressure. This difference seems especially significant, indicating that vasomotor nerve elements are involved in the first reaction but not in the second.

#### SUMMARY

Stimulation of the facial nerve at the geniculate ganglion causes dilation of arteries in the pia (parietal region).

This dilation presents a sharp contrast to the dilation which results from a fall of blood pressure. The latter reaction has been described in a recent paper of this series (fig. 5).

The differences between these two reactions may be summarized as follows: The vasodilation associated with stimulation of the facial nerve occurs when the blood pressure is normal at the outset and remains constant throughout the period of stimulation; the response is strictly ipsilateral and is abolished by cocaine.

The vasodilation associated with fall of blood pressure occurs only when the latter reaches a critical level; it involves the pial arteries of both hemispheres and is not affected by cocaine.

It seems probable that higher mammals (cats and monkeys) possess a true vasodilator innervation of the arteries supplying the parietal cerebral cortex. The nerve fibers involved come from the medulla and reach their destination via the facial nerve, the great superficial petrosal nerve and, in monkeys at least, the internal carotid nerves.



## PSYCHIC PHENOMENA IN ASSOCIATION WITH CARDIAC FAILURE

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In an article on psychic disturbances in association with visceral diseases, which has remained a classic from the descriptive standpoint, Henry Head, more than thirty years ago, made the assertion:

We are all conscious that our mental well-being is dependent on the right activity of our internal organs, and daily experience shows that grave mental disturbances may arise in connection with visceral disease.

In the organization of the body complexus there are, phylogenetically and ontogenetically, two great integrating systems of organs: the brain and the heart, with their extensions. While several other organs of the body are in key positions as far as vital capacity is concerned, the biologic functioning of the organism in the aggregate depends constantly on the integrity of these two great systems. If it is true, as is now believed in psychobiology, that the mind represents the total activity of the organism, one would expect to demonstrate definite mental deviations during structural and functional alterations of the organs of the body, and particularly in those of such integrative significance as the heart.

Since the heart is an organ of active motility, there are local sensations in connection with its action, which are usually not painful, whereby a "sensitive" person may become aware of its behavior and thus be cognizant at times of cardiac abnormality, such as palpitation, irregular action, tachycardia, bradycardia or unusually forceful beats. This creates a situation of worry and preoccupation, which is based on the common knowledge of the relationship between the heart action and life. A structural cardiac disorder being assumed to be present, since I am not dealing in this paper with cardiac neuroses as such, as the patient becomes more aware of the disorder, states of apprehension and fear, accompanied by panicky sensations and alternating with mild depression or emotional irritability, may develop and complicate the medical and nursing treatment.

These mental symptoms may become more pronounced in the event of local pain occurring in association with angina pectoris, endocarditis, pericarditis and pericardial effusion and may even produce active dis-

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sociations of the personality, with curious delusions based on misinterpretations of the local cardiac phenomena. When there are marked disturbances in the circulation (such as vasomotor constrictions or feebleness of the heart action with cyanosis) or secondary lesions in the brain (such as embolism from valvular lesions or edema from incompetency), active hallucinations and confusions and even secondary dementias, with disturbances in memory and judgment, may ensue.

#### MENTAL SYMPTOMS IN ASSOCIATION WITH ACUTE HEART FAILURE

Although from time to time the physician encounters cases of heart disease in which the mental symptoms so dominate the clinical picture and are so severe as to justify a diagnosis of "acute cardiac psychosis," the number is comparatively small, being scarcely more than 1 per cent in Romberg's series in the Leipzig clinic (13 instances of psychosis in 1,200 cases of heart disease). The symptoms of mental import presented by the patients, as described by various authors, include a depressive affect, vague fears of companions, nurses and ward physicians, ideas of persecution and poisoning, visual and auditory hallucinations, refusal to take nourishment or medication, insomnia and attempts to throw themselves out of windows or other suicidal maneuvers during fluctuating periods of excitement. The psychosis frequently disappears just before death.

This type of disorder is always a serious development, and one must be particularly guarded in the prognosis in case of patients over 40 years of age. Mitral stenosis and ischemic necrosis of the heart muscle are apparently more likely to be associated with mental changes than other cardiac lesions.

Some of the mental phenomena associated with acute heart failure, beginning with the simple disturbances of consciousness and proceeding to the complicated psychotic manifestations, may be described as follows:

(a) *Syncopal or Fainting Attacks*.—A diminished blood supply to the brain may cause a feeling of extreme bodily weakness with collapse and unconsciousness. Such attacks are prone to occur in the early stages of heart block, in which situation tracings of the jugular pulse are of differential significance. The patient may have several brief attacks of unconsciousness within an hour. Loss of consciousness is common, owing to "heart flutter" in cases of rapid auricular action, in which the ventricular output is insufficient for cerebral integrity.

(b) *Convulsive Phenomena*.—Vertigo is a common feature of aortic disease and in its severer forms, as seen in cases of both hypertension and hypotension, may resemble mild epileptic attacks, with transitory

loss of consciousness. There is a type of attack, seen more often in elderly persons who have extensive arteriosclerosis and extrasystoles, which consists of transient loss of consciousness occurring without warning and resembling petit mal. The attack may be merely subjective, or it may be observed by others as a staring, "vacant" facial expression. In the extreme forms the patient may assume an odd, constrained posture and even fall to the floor.

In the event of complete arrest of the blood supply to the brain in cases of the Stokes-Adams syndrome, not only does loss of consciousness occur but, if this is prolonged, epileptiform convulsions may assume alarming proportions. Convulsions may also occur periodically as a late complication in cases of rheumatic endocarditis, so that the patient may live for years as an "epileptic." Reports of cases of epilepsy originating from pathologic conditions in the heart appear from time to time in the medical literature under the caption "cardiac epilepsy." In many of these instances, however, as in the examples reported by Cerviño and Abascal, the minor manifestations of epilepsy had preceded the heart disease and were merely strongly accentuated by the latter disorder.

(c) *Prolonged Mild Mental Phenomena.*—Persons suffering from decompensation of the heart in the early stages are prone to mild depression, insomnia and general irritability, with associated dysfunction of digestion and respiration. They complain of general fatigue, with inability to maintain concentrated attention on reading or writing, and impairment of memory for recent events, even for what has just been heard or read. Troubled and broken sleep often increases these phenomena.

(d) *Delirium, Confusion and Acute Excitement.*—True toxic delirium of exogenous origin is sometimes encountered in cases of acute pericarditis or endocarditis with myocardial decompensation. As in any other toxic delirium the situation is grave from the standpoint of life, particularly as there is excessive psychomotor activity, often with frightening hallucinatory experiences, incoherent speech and sleeplessness, all of which place an added embarrassment on the impaired circulatory functions. A delirioid reaction, similar to the toxic delirium in many respects, is sometimes observed during breathing of the Cheyne-Stokes type, particularly during the period of dyspnea; it may subside during the period of apnea. It has been noted by Riesman that a state of confusion is the most common of the cardiac psychoses and occurs in myocardial disease with auricular fibrillation, with or without decompensation. The confusion has been found to be greater in persons who suffer from loss of sleep and is noted either in the hypnagogic or the hypnapagogic state, during which the surroundings are confused and

general disorientation is in the foreground. Such a patient may become rational when the attention is urgently aroused.

Clouston spoke of "cyanotic delirium" and "cyanotic insanity" caused by impaired oxygenation of the blood, observed in cases of combined bronchitis, cardiac failure and asthma. The symptoms, which are confusion, hallucinations of sight, vague fears, insomnia and suicidal impulses, are usually worse at night and often terminate in mental sluggishness, passing finally into deep coma. There occurs also a type of acute excitement, principally in elderly persons with fibrous myocarditis, in which the prognosis is not good and death occurs usually within a week after the psychosis appears. The symptoms are active disorganized behavior, with disorientation and struggling with environmental restraint. In some cases the excitement alternates with periods of apathy and mutism. Frequently, during the active excitement the forceful muscular efforts lead to complete and immediate decompensation, with sudden death. It was emphasized by Head that patients suffering from aortic valvular disease are liable to these attacks of excitement.

(c) *Hallucinatory Phenomena.*—Various forms of hallucinations may appear in patients with severe cardiac decompensation, but are said to be of most frequent occurrence in association with aortic disease. The hallucinations may be simple rhythmic acoasmatic phenomena, such as knocking sounds, ringing of bells, snappings and clickings, which possibly may be interpreted on the basis of anemia or sluggish circulatory activities in the sensory brain centers or of a trophic disorder in the peripheral end-organs. From the visual standpoint the patient may see objects on the ceiling or the walls of the room or other visions on first awakening from sleep. On the other hand, the hallucinations may be more complex, bringing parts of personal experiences into the foreground. Pictures of faces around the foot of the bed or peering in at the windows may appear, often in a menacing way. These hallucinations do not usually have the same significance as those in schizophrenia, in which they are commonly of bizarre and mystic import. The hallucinations in cases of cardiac disease may be said to be those of ego or of identification significance and usually have to do with ideas concerning relatives or friends, in spite of the fact that on many occasions they are disagreeable experiences. Voices are often described as carrying on conversations or giving instructions, or as engaged in making derogatory remarks about the patient. In persons with cardiac disease, in contrast to the usual patient with schizophrenia, insight into the experiences is good, and the patient may be more or less ashamed to mention them unless he has complete confidence in the physician. It may be said that they are usually transitory and probably do not affect

the prognosis. Care should be taken that actual dream states are not interpreted in the light of true hallucinations, although probably the mechanisms are similar. It has been said by several authors that patients with cardiac disease have typical dreams, which are described as shadowy, ghostlike figures about the room or large cloudlike, floating objects which close in about the dreamer, threatening him with extinction. The patient may awaken in a state of fright after such a nightmare, and it has been conjectured that occasionally a patient may have died from the additional excitement engendered by such an experience. Sudden painful, emotional shock has been known to arrest the action of the heart, or to excite it to a degree to injure its valves or the chordae tendineae.

(f) *Delusions*.—Delusions in association with cardiac disease usually have a transitory significance; in Riesman's experience they occurred only in connection with lesions of the aortic valve, but they have been described as present in other forms of cardiac disorder. They are usually associated with sensations of terror, as they imply immediate danger. The patient commonly imagines that some one is hiding behind the door of his room, in a closet or somewhere in the immediate vicinity, to do him bodily injury or to spy on his activities. He may have these semisystematized delusions for several days before putting his confidence in the physician. It is characteristic of the patient with cardiac disease to maintain a secretive and confidential attitude while discussing his delusions; he usually relates them in a whispered voice, although this is not always the case, as on occasions the patient will shout his ideas for the whole world to hear, after the fashion of "to whom it may concern."

It is said that delusions may arise particularly when the patient is receiving full doses of digitalis. Therefore, it has been thought that digitalis may have a determining influence on the disturbance. However, as Riesman pointed out, cases of psychic disturbance caused by digitalis must be rare, since digitalis is used universally and often in a careless manner as to the dose. Phenomena of the type which has been described as acute psychotic manifestations disappear with improvement in the cardiac tone and the reestablishment of compensation.

#### CARDIAC FAILURE IN ASSOCIATION WITH SECONDARY LESIONS OF THE BRAIN

Local lesions in the brain, such as thrombosis and postembolic disorders, with or without neurologic localizing signs, may produce definite psychoses, which are classified with the "organic reactions." The mental symptoms that usually accompany such disorders are general irrita-



bility, with change in character, disorder of judgment, disturbance of memory and difficulties in orientation. These cardinal symptoms may also be accompanied by various hallucinations and delusions, according to the temperamental make-up of the patient. There may also be toxic components, with confusion, excitement and fluctuating delirium, associated with inflammation or resulting from meningitis caused by bacterial emboli which lodge in the meninges in cases of bacterial endocarditis, as described by Felberbaum and Finesilver.

#### ETIOLOGY

(a) *Predisposing Factors in the Personality.*—Head, in the article already cited, stated:

Reflected pain of visceral origin may bring in its train all those images and dispositions which exist normally at the fringe of or entirely outside the field of consciousness. All those sensations that are associated with visceral activity, which do not exist in consciousness under normal conditions, come to the surface, altering the character of the individual.

This remark somewhat foreshadows or anticipates some of the modern researches and impressions concerning the relationships of body and mind. While the general nature of the mental symptoms is capable of being subgrouped into more or less definite categories, it is conceded by most psychiatrists that there are many individualistic expressions of mental disorder and that the content of these mechanisms varies with the training, the personal experiences and the type of adjustment in the aggregate. That is, the type of personality has something to do not only with whether there shall be psychotic manifestations in a case of visceral disease, including cardiac disorder, but with what shall be revealed as a symptom in the event a psychosis is released. This does not apply too strictly to the simpler varieties of disturbance of consciousness, but it has some significance in connection with the more complex psychotic reactions, such as delusions and vivid hallucinatory experiences.

The emotional make-up and the amount of stress placed on the patient are important factors in the development of such conditions as hypertension, and in this connection an interesting investigation has been carried out by Donnison, who studied the blood pressure in the African native, in view of its bearing on the etiology of hyperpiesia and arteriosclerosis. Examination of a large number of Africans revealed data to show that emotional stress, rather than diet, toxins, etc., is the important factor in the production of hypertension. Hypertension was a rare condition among these natives, and it is interesting to compare the findings of Donnison with those of Ismail, who investigated the incidence of hypertension in Egypt. In a study of over 3,000

persons, many of whom were followed for ten or fifteen years, as they were seen in private practice, Ismail found that chronic primary hyperpiesis, in the absence of chronic inflammatory renal changes, is common in Egypt, accounting for about 10 per cent of all patients in private clinics (composed of mental workers and middle class fellaheen) while it is rare in hospital practice; not a single patient was admitted to a hospital during a period of four years, indicating that the so-called "higher levels of civilization" bear the determining factors.

I am convinced from my own observations on the mentally disordered that persons having either a pronounced cyclothymic or a paranoid personality or character, which later may express itself as manic-depressive psychosis and a paranoid state, respectively, are most likely to acquire serious and lethal cardiac conditions. In this respect, persons of the "extroverted" and the "hypertensive" emotional type are in contrast with those of the schizothymic type, who are not given to strenuous battling with the world or overly concerned with objective matters and who are not so likely to have hyperpiesis, cardiac hypertrophy and cardiac decompensation. In any given case the released symptoms of emotional, or of more strictly personal, significance are frequently overridden and obscured to a large extent by the immediate and acute clouding of consciousness, with its disturbances of memory, judgment and orientation and confusion of thought, the results of cardiac decompensation and circulatory failure.

(b) *Somatic Factors.*—In a series of 265 consecutive necropsies performed in a public hospital for mental diseases, van Lier observed 30 instances of definite macroscopic lesion of the heart. In his clinical experience, when a person predisposed to mental disorder acquires incompetency of the heart, the character tends to change to irritability, explosiveness of temper and anxiety states. If the mental disease develops in a person with an already established defect of the heart, the character of the psychosis is influenced by the disturbance in the brain due to the cardiac lesion. Even when the heart disease is not an outstanding clinical manifestation, it should be suspected in such types of mental change, and if found, it should never be neglected, as proper treatment has been known to aid in the cure of the psychosis and anxiety states have been favorably influenced by restoring cardiac compensation. Claude and his associates found that the venous pressure was increased from 16 to 20 cm. of water in the milder forms of melancholia, dementia praecox, dementia paralytica, alcoholism, acute mental confusion and polyneuritic psychoses. The pressure rose to 36 cm. in cases of severe stupor and depression with cyanosis of the limbs and sluggish circulation, but a high venous pressure was rarely observed in cases of manic excitement. In persons with high pressures this phe-

nomenon seemed to parallel the gravity of the mental disease, decreasing as the patient's condition improved. It was apparently connected with functional failure of the myocardium and respiratory insufficiency, as evident particularly in cases of acute psychosis.

From an anatomic standpoint, the effect of functional circulatory changes on the brain tissue was emphasized by Spielmeyer, who stated:

Anatomical investigation shows that a variety of changes can be of circulatory origin, without, however, there being any change in the size of the lumen of the vessel nor any pathological changes in the vessel wall. It can also be proved anatomically that a non-organic obstruction to the circulation may cause a degeneration of the central nervous system—in other words, a disturbance of the circulatory function only may produce similar conditions to those which are caused by an organic occlusion of circulation [namely] sudden drowsiness and coma, or excitement with anxiety and signs of acute delirium. . . . Such general cerebral symptoms can be in relationship with widespread vasomotor disturbances, which have acted on large parts of the brain tissue.

Flater found cerebral symptoms in 50 per cent of his cases of ulcerative valvular disease, but, apart from the changes in the brain caused by emboli, little has been reported on the changes in the central nervous system in cases of heart disease. Toxic factors have been considered theoretically as present in cases in which there were no emboli, but Bodechtel expressed the belief that the diffuse cerebral changes in such instances are the result of vascular spasms and that even embolic abscesses are initiated by vascular spasms, constituting a *locus minoris resistentiae* resulting in softening of tissue to which bacteria find their way from the blood stream. Of neuropathologic changes reported, one finds a range from no notable alterations to significant loss of neuron cells, acute cellular disorders, ischemic cell changes, focal areas of early and recent necrosis scattered through the brain substance, accumulations of gutter cells and astrocytes about the vessels, patchy losses of myelin and, finally, perivascular hemorrhages and "embolic encephalitis."

#### REPORT OF CASES

The following notes on cases are given to illustrate a few of the combinations of reactions in general psychiatric work.

CASE 1.—A Negro aged 41, a laborer, was brought to the hospital because recently "voices" had told him to go forth into the world to preach and found a new religion and because he had made extravagant claims to the effect that he was related to King Solomon, after whom he intended to shape his life.

There was no significant family history, no account of serious illnesses and no record of misdemeanors. There was a history of fairly heavy indulgence in alcohol, but this had not produced any acute mental disturbances. The first deviation from his usual good health and normal behavior was noticed about two months before his hospitalization, when he began to attend church a great deal and to pray more than usual. To his companions he stated the belief that he

was consecrated to the Holy Ghost and could "speak in tongues." While this was not interpreted by his Negro associates as being anything abnormal, they conceded that it was a definite change in behavior. When admitted to the hospital he was disoriented as to time and place and was childish in his reactions; he said that he was in constant auditory touch with the Lord. He had no insight into his mental disorder but thought he had been sent to the hospital to be treated for a severe cold.

Physical examination revealed hard and tortuous radial vessels; vigorous arterial pulsations on the left side of the neck; a diffuse apex beat of the heart, perceptible over a considerable area of the chest; diminished muscular tone; a loud systolic murmur over the apex, and accentuation of the second aortic sound. The blood pressure was 220 systolic and 165 diastolic, and the pulse rate was 120 per minute. Serologic tests gave negative results and there were no neurologic findings.

The patient suffered from dyspnea and tired easily on exertion. He was given the treatment routine for such a condition and with the general toning up of the cardiac condition the hallucinations ceased, as did the extravagant delusions. At the end of three months the patient was sent home free from the psychosis and with improvement in the cardiac condition. After being at home for a few months he suffered acute cardiac decompensation, with rapidly developing general anasarca, and died of pulmonary edema.

CASE 2.—A white woman aged 56, a domestic, was sent to the hospital because, owing to mental disturbance, she had become a problem in the home. There was no family history of heart trouble, but there was a record of psychoses, her mother having had a mental illness. The patient had worked in knitting mills most of her adult life. She had been married three times and was childless; she had indulged heavily in alcohol for many years, during which there had been various signs of instability. A few weeks before her admission to the hospital she started to lose weight rapidly, became depressed, suffered from dyspnea, bore an anxious, worried facial expression and complained of hearing voices. She heard her dead husband's voice and spiritual rappings as messages from the dead. She became vulgar and assaultive toward her sister-in-law.

When admitted to the hospital, she was suspicious of the physicians, assaultive toward the nurses and paranoid toward the family. At times she was sufficiently confused to be disoriented for time, place and person. Objectively, she appeared pale and sick. Physical examination showed the area of cardiac dulness to be enlarged to the left, to the right and downward. There were no murmurs, but the pulmonic sounds were distant and the heart rate was irregular with frequent extrasystoles. The blood pressure was 220 systolic and 145 diastolic. The laboratory findings were normal.

With treatment the heart improved in compensation, and the arrhythmia disappeared, at which time the patient rapidly lost her mental symptoms and became quiet, pleasant, cooperative and generally normal in her attitude. She remained well for about six months, when the cardiac condition suddenly became worse, with intermittent fibrillation. (An electrocardiogram showed auricular fibrillation and myocardial disease.) There was retention of nonprotein nitrogen in the blood, and albumin appeared in the urine. The symptoms of decompensation with pulmonary congestion and dyspnea were accompanied by a return of all the previous mental troubles. She failed to respond to further treatment and died of complete acute cardiac decompensation. In this case a relationship between the cardiac condition and the exacerbation of the mental symptoms seems to be clearly established.

CASE 3.—A white man aged 56, an officer in the army, was admitted to the hospital because he had recently become self-centered, complaining, delusional about his wife's fidelity and irritable toward his companions.

His mother had died at the age of 60, with "heart disease," and a brother at the age of 40, of bacterial endocarditis. There was no family history of mental disorder. The patient had had yellow fever at the age of 6 years, "severe" gonorrhea at 30 and typhoid at 31, which diseases left him "with a weak heart." From the age of 25 for twenty years, he had over indulged in alcoholic beverages. At the age of 37 he had an attack of mental disorder of sufficient severity to necessitate a nine month period of treatment in a hospital for persons with mental diseases. On this occasion he was depressed and complained of peculiar somatic sensations: he was self-deprecatory and apprehensive of a "complete collapse" and was suspicious and jealous of his wife, who was twenty years younger than himself. There were no disturbances of memory or orientation, and his physicians considered him to be suffering from depression with a neurastheniform coloring, placing considerable emphasis on the history of alcoholic indulgence and unsatisfactory adjustment to work. He recovered from this psychosis and adjusted fairly well for more than eighteen years, when he began to fail sexually and again became suspicious of his wife and of their mutual friends. This, with apprehensiveness, instability and mental confusion, increased to a point where it was necessary to remove him from his usual personal contacts.

At the time of his last admission to the hospital he was depressed, irritable and restless, thought that he was ill treated and complained bitterly about the attitude of the nurses. He was in active mental conflict over his impotency and told of several homosexual experiences and other perversions "while under the influence of alcohol." He expressed considerable insight into his domestic suspicions, stating that they were groundless and that he had made his wife unnecessarily unhappy.

Physically his general appearance was sickly; the facial expression was anxious and worried; the superficial temporal vessels were tortuous, and there was edema of the lower extremities. He complained of various aches, including pain in the center of the chest and through the left arm. He was found to be suffering from heart disease, with a loud systolic murmur over the mitral and the aortic area and enlargement of the heart to the left. The heart rate was 84, with irregularities, and the blood pressure was 184 systolic and 106 diastolic. The superficial arteries were sclerotic, and the liver was enlarged. Laboratory examinations, including determinations of the blood chemistry, gave essentially normal results.

The condition of the heart gradually improved with treatment, and at the same time mental improvement was pronounced. The patient stopped complaining and fault finding and was able to go about unsupervised, with special privileges; he was cheerful and pleasant toward his wife; in fact, there was little, if any, evidence of mental disorder for eight months. The patient then again became excited and apprehensive, with ideas that he was about to die, and all the old paranoid symptoms returned. His pulse became rapid, and he again complained of pains in the chest. At this time an electrocardiogram showed auricular fibrillation. Chemical examination of the blood showed moderate retention of non-protein nitrogen and some retention of uric acid. He again recovered from the attack, showing corresponding improvement in the mental reactions. After six months, during which he seemed to be in comparatively good condition, he died unexpectedly, while enjoying an afternoon's entertainment.

CASE 4.—A mulatto woman aged 65, married, a domestic, was hospitalized for defects of memory, disorientation and general mental confusion, which had



appeared recently in association with "failure in health," with dyspnea and palpitation of the heart. The family history was practically without significance. Her early history was relatively unimportant, but later in life she had had pneumonia twice and influenza and rheumatism.

When admitted to the hospital, she was out of touch with reality but was pleasant and tried to cooperate. She talked freely about having been badly treated by her husband and at times seemed frightened, particularly in examination situations. The memory defect was in the foreground, and she had no insight into her mental difficulty. On one occasion she complained to a nurse that a man had been annoying her all night, this being the only delusional expression noted. At the physical examination she told of having been nervous, short of breath and annoyed by "flutterings of the heart" during the preceding few weeks. The peripheral arteries were slightly sclerotic; the heart sounds were poor in quality, with accentuation of the aortic sounds, and the action was irregular. The blood pressure was 160 systolic and 80 diastolic, and the pulse rate, 104 per minute. The laboratory findings were normal.

With appropriate treatment the patient was soon able to be up and about the ward, to make her own bed and to do other light tasks. The mental confusion subsided correspondingly, and after a few weeks there were no signs of mental disorder. Occasionally she complained of "acute indigestion" associated with pain radiating down the left arm and rapid, irregular pulse. Treatment with digitalis always relieved the condition. This seemed like a mild anginal attack, although angina pectoris is exceedingly rare in the Negro race. (The patient was half white.) As there was no place in the outside environment available for her to go after recovery from the psychosis where she could receive the proper supervision, she was retained in the hospital, where she still resides. She is comfortable, neat and tidy and talks amiably with other patients but occasionally has the slight angina-like attacks already mentioned, at which time she is somewhat depressed and complains of general discomfort and "misery."

CASE 5.—A Negro aged 46, single, a laborer, was sent to the hospital because of loss of memory, defects in judgment, general mental confusion and quarrelsome, irritable attitudes. The family history was without significance. The patient as a child had been incorrigible and difficult to get along with, both in school and at home. However, later he worked fairly well but was seclusive in social habits, not entering into the usual games, amusements, etc., characteristic of the young Negro. He had indulged quite heavily in alcohol but had never suffered from an alcoholic psychosis. He had always been active sexually.

At the time of his admission to the hospital he was conspicuously dyspneic and appeared to be suffering from an acute disturbance of the heart. He was circumstantial and partly confused in conversation, speaking with a scanning impairment reminding one of the type of speech common in dementia paralytica. His judgment was notably poor, functioning in a childish manner, and memory was inaccurate for recent events. The mood was one of contentment; there were no hallucinations or obvious delusions. At the physical examination he was fairly well oriented and described some subjective symptoms, saying that he had suffered from headaches and dizziness and from severe pain in the chest. There was no insight into his mental impairment. Objectively, the gait was ataxic; the arteries of the neck, arms and groins pulsated visibly; the pulse was typically of the Corrigan variety, the cardiac dulness was increased to the left and the right, and a mitral systolic murmur transmitted upward over the aortic area was prominent. The second aortic sound was sharply accentuated. The patient was dyspneic and in considerable distress, with respiration of the typical Cheyne-

Stokes variety. There were fine, crepitant râles over the pulmonary areas on inspiration and a definite expiratory wheeze. There was general edema of the body, with ascites, the abdomen being tympanitic only along an area in the midline and dull in the flanks. The blood pressure was 225 systolic and 125 diastolic. The Wassermann reaction of the blood and spinal fluid was negative.

After two months of treatment, the patient began to improve and in six months was able to make prolonged visits home. At this time he had few residual physical or mental symptoms, the confusion and disorder in the intellectual sphere having subsided with the physical improvement.

#### SUMMARY

These clinical notes are offered to illustrate that there is in certain cases a definite relationship between the psychosis and the cardiac situation rather than to support any theory as to the nature of this relationship or to emphasize any type of therapy. These and similar experiences with patients indicate that the mental reaction itself, on the whole, depends on integration of the personality and constitutional factors other than, and existing prior to, the cardiac disorder. Serious physical illness of this type certainly releases the mental expressions and disorganizes the previous integration in some cases, while in others it modifies the psychosis, if the mental trouble is already in existence. In studying cardiac psychoses a thorough psychobiologic method is essential. There should be a life history of the patient, with all that it implies, a thorough evaluation of the physical constitution, a study of the clinical pathologic picture as such and, finally, a postmortem examination.

#### BIBLIOGRAPHY

- Ameghio, A.: Existe una locura cardíaca? *Rev. Asoc. méd. argent.* **37**:163, 1924.  
 Arsimoles, L.: Troubles mentaux dans les maladies du cœur, *Echo méd. du Nord* **14**:189, 1910.  
 Auban and Beurnier: Délire de type maniaque chez un cardiaque, *Toulouse méd.* **11**:216, 1909.  
 Babcock, R. H.: Cardiac Hypochondriacs, *New York M. J.* **100**:7, 1914.  
 Bodechtel, G.: Gehirnveränderungen bei Herzkrankheiten, *Ztschr. f. d. ges. Neurol. u. Psychiat.* **140**:657, 1932.  
 Brown, L.: Mental Conditions of Patients with Heart Disease, *Ztschr. f. Psychol.* **106**:1, 1928.  
 Campbell, C. M.: The Rôle of Instinct, Emotion and Personality in Disorders of the Heart, with Suggestions for a Clinical Record, *J. A. M. A.* **71**:1621 (Nov. 16) 1918.  
 Castex, M. R., and Vivaldo, J. C.: Los trastornos mentales en los cardíacos, *Prensa méd. argent.* **3**:317 and 331, 1917.  
 Cénac and Baruk: Délire imaginatif de grandeur avec excitation physique et conséquences médico-legales: Delvia consecutif à l'apparition d'insuffisance cardiaque chez un éthylique chronique hypertendu, *Encéphale* **211**:710, 1926.  
 Cervoño, J. M., and Abascal, M. P.: Cardiac Epilepsy, *Rev. med. d. Uruguay* **28**:223, 1925.

- Claude, H.; Targowla, R., and Lamache, A.: Les variations de la tension véneuse au cours des psychopathies, *Presse méd.* **34**:1193, 1926.
- Clouston, T. S.: *Clinical Lectures on Mental Disease*, ed. 6, Philadelphia, Lea Bros. & Co., 1904.
- Curschmann, H., Jr.: Hysterische Tachypnoe bei organischen Herzerkrankungen, *München. med. Wchnschr.* **50**:284, 1903.
- Zur Diagnose nervöser insbesondere thyreogener, Herzbeschwerden Heeresangehöriger mittels der Adrenalin-Augenprobe und der Lymphocytenauszählung, *Med. Klin.* **12**:253, 1916.
- Curtin, R. G.: The Delirium Noticed in Cardiac Disease, *Philadelphia Hosp. Rep.* **6**:10, 1905.
- De Janis, A. R.: Psychoanalysis of the Heart, *M. Rec.* **97**:568, 1920.
- Donnison, C. P.: Blood Pressure in the African Native: Its Bearing upon the Aetiology of Hyperpiesia and Arteriosclerosis, *Lancet* **1**:6, 1929.
- Durozier, P.: Du délire et du coma digitaliques, *Gaz. hebdomadaire de médecine* **11**:780, 1874.
- Eichenberger, E.: Somatisch bedingte Augsträume. Ein Beitrag zur Pathogenese des Angstgefühls, *Arch. f. Psychiat.* **87**:640, 1929.
- Felberbaum, D., and Finesilver, B.: Cerebral Manifestations in Cardiac Disorders, *M. J. & Rec.* **129**:247, 1929.
- Fliessinger, C.: La psychologie du cardiaque, *Rev. de l'hypnot. et psychol. physiol.* **17**:303, 1902-1903.
- Français, H., and Darcagne, G.: Sur les psychoses d'origine cardiaque, *Bull. méd., Paris* **21**:713, 1907.
- France, J. I.: Some Observations on the Nervous and Mental Symptoms of Heart Disease, *J. A. M. A.* **54**:652 (Feb. 20) 1915.
- Gibson, A. G.: Mental Changes in Cardiac Disease, *J. Ment. Sc.* **76**:632, 1930.
- Goldberger, M.: Organic Heart Diseases Combined with Insanity, *Elméstudok* **6**:35, 1909.
- Grossmann, K.: Psychotherapy in Heart Disease, *München. med. Wchnschr.* **71**:619, 1924.
- Halsey, R. H.: The Psychology of the Cardiac and the Doctor, *Arch. Pediat.* **38**:82, 1921.
- Hamburger, W. W.: Acute Cardiac Psychoses: Analysis of Toxic and Circulatory Factors in Five Cases of Acute Confusion, *M. Clin. North America* **7**:465, 1923.
- Head, Henry: Certain Mental Changes That Accompany Visceral Disease, *Brain* **24**:345, 1901.
- Herz, M.: Die Angst der Herzkranken, *Prag. med. Wchnschr.* **35**:271, 1910.
- Hirschfelder, A. D.: *Diseases of the Heart and Aorta*, ed. 3, Philadelphia, J. B. Lippincott Co., 1918.
- Horner, A. A., Jr.: Incidence of Heart Disease in Acute Psychoses, *Danvers State Hospital, 1879-1909*, Boston M. & S. J. **163**:200, 1910.
- House, W.: The Psychoses of Heart Disease, *J. A. M. A.* **45**:1306 (Oct. 28) 1905.
- Ismail, A.: High Blood Pressure in Egypt: Etiology of Hyperpiesis, *Lancet* **2**:275, 1928.
- Jaquet, A.: Ueber nervöse und psychische Störungen bei Herzkranken, *Schweiz. med. Wchnschr.* **52**:245, 1922.
- Kroll, K. A.: Diseases of the Heart Muscle Resulting in Embolism, *Nederl. tijdschr. v. geneesk.* **66**:160, 1922.
- Leendertz, P. P.: Intoxicatie-psychose bij hartlijden, *Psychiat. en neurol. bl.* **12**:530, 1908.

- Leyser, E.: Herzkrankheiten und Psychosen: Eine klinische Studie, Berlin, S. Karger, 1924; Abhandl. a. d. Neurol. **25**:7, 1924.
- Lilienstein: Psychoneurosen bei Herzkrankheiten, Arch. f. Psychiat. **52**:954, 1913.
- MacKenzie, James: Diseases of the Heart, ed. 3, London, H. Frowde, 1914.
- Massini, R.: Ueber Delirien beim Herzkranken, Schweiz. med. Wchnschr. **54**:397, 1924.
- Mouisset, F., and Gaté, J.: Troubles psychiques, hystéro-épileptiques chez une cardiaque, Rev. le méd. **32**:428, 1912.
- Müller, L. R.: Ueber die Beziehungen von seelischen Empfindungen zu Herzstörungen, München. med. Wchnschr. **53**:14, 1906.
- Pelnar, J.: Des troubles psychiques du cours des maladies du cœur, Compt. rend. cong. internat. de méd. (Sect. de path. int.) **14**:586, 1904.
- Riesman, D.: Acute Psychoses Arising During the Course of Heart Disease, Am. J. M. Sc. **161**:157, 1921.
- Rigler, O.: Ueber den Einfluss psychischer Traumen auf bestehende Herzkrankungen, Hamb. med. Uebersehefte **1**:297, 1914-1915.
- Robin, G., and Cénac: Troubles du caractère et cardiopathies, Ann. méd.-psychol. (pt. 1) **83**:155, 1932.
- Romberg, Ernst: Lehrbuch der Krankheiten des Herzens und der Blutgefässe, ed. 3, Stuttgart, F. Enke, 1921.
- Saathoff, L.: Herzkrankheit und Psychose, München. med. Wchnschr. **57**:509, 1910.
- Smith, C. H.: The Psychology of the Cardiac and the Doctor, Arch. Pediat. **37**:687, 1920.
- Spielmeyer, W.: Influence of Functional Circulatory Disturbances on the Central Nervous System, J. Ment. Sc. **76**:641, 1930.
- Stroumann, G.: Ueber die psychoschen Störungen bei dekompensierten Herzkranken, speziell über die Zusammenhänge mit der therapeutischen Entwässerung, Nervenarzt **3**:396, 1930.
- Targowla, R.: Folie cardiaque et insuffisance ventriculaire gauche, Bull. et mém. Soc. méd. d. hôp. de Paris **47**:615, 1923.
- Thiesen, A. C.: Ueber psychische Störungen bei Herzkranken, Kiel, Schmidt & Klaunig, 1916.
- van Lier, J. I.: Psychoses and the Heart, Nederl. tijdschr. v. geneesk. **2**:2661, 1925.
- Veiel, F.: Ueber die Beziehungen von seelischen Empfindungen zu Herzstörungen, München. med. Wchnschr. **53**:312, 1906.
- Verhaart, W. J. C.: Catatonic Symptoms in Organic Heart Disease, Psychiat. en neurol. bl. **31**:91, 1927.
- von Wyss, W. H.: Herz und Psyche in ihren Wechselwirkungen, Schweiz. med. Wchnschr. **57**:433, 1927.
- Wassermann, S.: Ueber psychische Störungen in Verbindung mit dem Cheyne-Stokesschen Phänomen bei gewissen Herzkranken (die Cheyne-Stokessche Psychose), Med. Klin. **17**:814, 1921.
- Weber, G. H.: Ueber psychische Störungen bei Herzkranken, Jena, B. Engau, 1901.
- Wilson, G. R.: The Onset of Fear and the Onset of Pain in Cardiac Disturbance, abstr., M. Press & Circ. **79**:641, 1905.
- Wyckoff, J.: Heart Disease and Psychogenic Disease, Bull. New York Acad. Med. **4**:437, 1928.

## THE PSYCHOPATHOLOGY OF METAPHOR

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The basic language, consisting of symbolizations for objects and performances and their qualities, is enriched by changing the meaning values of words through displacement, including extension and restriction. Displacement is accomplished by comparisons of all sorts—similes, metaphors and identifications (personifications or idealizations). They may all be classed as "aesthetic fictions," in the sense of Vaihinger,<sup>1</sup> "as if" constructs, developed purely for their useful economizing value in performing work (i. e., in leading to action). Similes preserve overtly the "as if" construction; metaphors tacitly acknowledge the "as if," whereas identifications of all sorts may or may not obey the "as if," and when they do, it is in a deeply disguised form.

Metaphor especially has been used in the development of words denoting affective states and intellectual processes—by the simple transfer of the meaning from the concrete sense to the figurative, as for example: "bitter," i. e., "biting," to "bitter" hatred; "feel," i. e., to handle with the palm of the hand, to "feelings," the emotional life.<sup>2</sup>

Language is full of such metaphors, no longer recognized as such except by the reader with historical curiosity. In general, when words have more than one meaning developmentally, they retain only the one directly and immediately inferred from the context, corresponding to current usage. Active attention is directed to metaphor by new usage, especially poetic, in mixed metaphor and in slang. All metaphors

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Adolf Meyer's interest in language as a system of meanings is well known to his students. The author is glad to express his appreciation to Dr. Meyer for the stimulus to a satisfying collateral interest.

1. Vaihinger, H.: *The Philosophy of "As If"; A System of the Theoretical, Practical and Religious Fictions of Mankind*, translated by C. K. Ogden, New York, Harcourt, Brace and Company, 1924.

2. A full elaboration of metaphorical change is given by:

Bloomfield, Leonard: *Study of Language*, New York, Henry Holt & Company, 1914.

Vendryes, J.: *Language: A Linguistic Introduction to History*, translated by Paul Radin, New York, Alfred A. Knopf, Inc., 1925.

Jespersen, O.: *Growth and Structure of the English Language*, ed. 4, revised, Oxford, Basil Blackwell, 1923.

Stern, Gustaf: *Meaning and Change of Meaning, with Special Reference to the English Language*, in *Göteborgs högskolas årsskrift*, Gothenburg, Sweden, Wettergren & Kerber, 1932, vol. 38, p. 1.



challenge inquiry, although some find a more immediate response than others. The short life of many metaphors testifies to their lack of fictional utility, bound up with their limited experiential character, or to a pressure for new forms, as in slang, in which survival depends on novelty.

One may assume (1) that language has an economizing function in the performance of work, (2) that it more or less accurately reflects the thinking and (3) that its primary purpose is social. The psychopathology of language must show deviation from the normal in one or more of these spheres.

In psychopathic patients disorders in the use of comparison are frequent—in simile, metaphor and identification. The patient who suffers a psycholeptic experience, “as if a knife were driven into the brain,” and the anxious patient who feels as if he were going to die are both making comparisons which overtly maintain the “as if” construction. Although the actual experiences used for comparison must remain unknown, such expressions find easy currency because of their qualities of sensation, feeling and emotion, which every one may imagine. They are fictions therefore—but useful fictions with social, as well as personal, value.

Identifications are perhaps as common as similes, as in the statements of patients with parergasia—“I am Jesus Christ” or “Napoleon”; the “triangle is the perfect form,” etc.—as well as in some neologisms and paralogisms. The “as if” construction, if it is still there remains so completely disguised that only rarely, by painstaking analysis, may one bring it into the open.

Pathologic metaphor is in my experience much less common than either simile or identification. Here the “as if” construction is tacitly admitted in the use of conventional expression, but the displacement takes an unusual turn. This paper will be confined to the psychopathology of metaphor.

#### REPORT OF CASES

The following summaries of reports of cases from the Henry Phipps Psychiatric Clinic show the psychopathic use of metaphor:

CASE 1.—A man aged 20 suffered an injury to the right eye at the age of 6 years, resulting in defective vision and strabismus. At the age of 14 he became acutely embarrassed socially because of the strabismus. Physicians stated that the loss of “perspective” ruined his chances in sports. He became the prey of a gnawing ambition to be an airplane pilot and felt frustrated because of the poor vision and strabismus. He compared himself with Wiley Post and refused to compromise with ground work. He wanted “*to be an airplane pilot, in order to get the proper perspective on the world.*” He became seclusive and stayed up all night to carry on radio communication with amateurs on the other side of the earth, enjoying the sense of power without the necessity for public exposure of

his defects. There were many futile attempts at self-help for the eyes through faith healing and autohypnosis and one transient episode when he was found stripped to the waist and lying on the ground in the rain, confused. He spent a few hours in a hospital for psychopathic patients and then was sent to his home in another state. Increasingly gloomy, surly and irritable, he became resentful of his heredity because of his short stature, of his teachers because they did not recognize his real worth and, finally, of proffers of help from physicians. In the hospital he established a certain degree of rapport when an effort was made to improve the cosmetic effect of the eyes. After his discharge he again became resentful and discouraged after failing in his efforts to become a pilot, and finally committed suicide.

The patient showed no other evidence of formal thinking disorder. The Hausmann absurdity test<sup>3</sup> was well performed. The intelligence was good.

CASE 2.—A youth aged 18 the last of a family with many distinguished members, who was forced to live away from home in the Southwest on account of asthma, began to recognize his intellectual limitations and became much upset. He began to masturbate and harbored the conviction that he could have his head master's wife as a mistress. When told by his teacher that he should not go to college, he became morose and tense; he felt frustrated and discriminated against on account of the masturbation and became suspicious, especially of his mother, who he felt was trying to kill him for the insurance. He smelled chloroform to be used to overpower him and heard his name called. He declared that "*people looked down*" on him. He was in a panic on his admission to the hospital, but he soon quieted, and the suspicious ideas subsided. At the time of writing, he is still in the hospital and remains fearful.

After improvement the patient declared people had looked down on him "*as if they had been standing on chairs.*" The use of a simile instead of metaphor may be looked on as a measure of his improvement in the objectivity in his thinking. At this time he still showed evidence of formal thinking disorder: About half of the Hausmann absurdities were spontaneously seen; the Binet absurdities were recognized; some common metaphors, as in proverbs, were properly appreciated, but others remained with the original concrete sense; the Binet fables were properly interpreted.

CASE 3.—A sailor aged 21, preoccupied over his being jilted, which he could not accept as final, and over the "sinfulness" of his sexual arousals, made a dramatic attempt at salvation by clambering over all obstacles and swimming in Chesapeake Bay toward the sun, because a motto on a calendar he had seen said: "*Never let us make a shadow by turning our backs on the sun.*" He was saved from drowning and brought to the hospital, where he was ecstatic. Recovery followed after a short period in the hospital.

The patient showed no other evidence of formal thinking disorder. Special tests were not made, owing to his short stay in the clinic.

CASE 4.—A Jewess aged 30, a government clerk, who had been divorced years ago because her husband was sexually too "gross" for her, became enamored autistically with her employer; she felt others in the office were plotting against her and that she had a special mission to protect the government against its political enemies; she suffered a psycholeptic attack, when momentarily "everything became clear" to her, only to have it all revert to the "complex" through

3. Hausmann, M. F.: A Method to Objectively Demonstrate Thinking Difficulties, *Am. J. Psychiat.* **13**:613, 1933.

a second attack. She established intimate relationship with nature and the cosmos. Stars shone where she stood, giving her confidence. She gazed long at the setting sun, remarking on the "pageantry," feeling it related to the anti-Jewish persecution, her embodiment of the Jewish race and God's protection of His people, and it seemed to her that she had her "*place in the sun*." When she passed the lame, a power left her body (bones) which brought them improvement, noted in their more erect posture. There developed aching in her bones, caused by the power leaving her. "*I had given too much of myself to the world and had not kept enough for myself.*" She was dejected and hopeless and did not improve with treatment.

The patient showed other evidences of thinking disorder. Identifications, with loss of the "as if" construction, were frequent. She felt that "food actually went into the bones" and that she improved by "growing an inch" (adding a cubit to the stature?).

In the Hausmann test about one third of the absurdities were recognized. The Binet absurdities were seen. In the use of every-day metaphor, as in proverbs, she did well.

CASE 5.—A woman aged 33, whose husband had been advised by his physician to secure a divorce because of the alleged relation of his anxiety attacks to the poor sexual adjustment, felt her marital security seriously threatened by her lack of orgasm, first called to her attention by her own physician. She gave up social life in an attempt to improve the home conditions. She became more preoccupied with her sex problem, but it did not improve; she was suspicious of her husband's fidelity, was puzzled and confused and showed multiple orientation and identifications.

*Upsetting her breakfast tray meant upsetting her life.*

*Diarrhea meant "everything going down-hill."*

*"All that planting of the iris and gardening—I do think I dug too deeply into things."*

*"It just seems to me that it's always eating, eating; always taking everything from everybody else and never giving anything."*

Recovery was slow. She afterwards decided to leave her husband.

When the patient was not confused, she recognized absurdities of the Binet and the Hausmann test. Double meanings were universal at the height of the confusion but disappeared with the confusion, long before her final recovery.

CASE 6.—A married woman aged 57 failed in an effort to prove herself entitled to join the chapter of the Daughters of the American Revolution in her small town; she was chagrined, especially since the records showed illegitimacy among her ancestors. She felt herself the butt of the town's ridicule, and there developed a far-reaching system of special meanings in names, the lost tribes of Israel, etc., with herself occupying a special place in the system. When the local gas company installed gas mains, and people talked about "*digging up the dirt*," she felt that this had a derogatory reference to her and was evidence that some power, perhaps the president of the gas company, wanted her out of the way and was influencing her husband to keep her in the hospital.

In the hospital she was more complacent but showed no essential improvement.

No other overt evidence of thinking disorder was noted, but special tests were not made.

#### COMMENT

The material may be divided into two groups showing two types of use of metaphor and with different psychopathologic backgrounds.

The first group, represented by cases 1, 2, 3 and 4, show reversal in the use of metaphor from the sense in which it was originally employed, namely, from the abstract to the concrete. The normal process of metaphor formation is reversed; there is inability to exclude automatically from the context the earlier concrete meaning; and undoubtedly both the abstract and the concrete usage were in mind at one and the same time. The inappropriateness of the usage is instantly felt and seems to be due (1) to the sudden and unexpected reversal of the usage to the earlier one, leaving the listener unprepared, and (2) to the patient's acting in accordance with the concrete meaning. The breakdown in logical thought occurs exclusively along the lines of special preoccupation, especially unattained ambitions or desires of all sorts—social, material, intellectual, sexual or religious. The context is obviously personal, but the patient admits at the same time interpretations which can have meaning only when viewed in the light of language development and which should have been immediately excluded.

Material in the second group, represented by cases 5 and 6, is probably more commonly observed than that in the first. Here the abuse of metaphor is in the abundance of new coinages, under the impetus of the dominant personal needs, and where the neutrality of casualness and the partisanship of significance are no longer differentiated. Everything looks alike and bears the biased imprint of self-reference, sensitivity and frustrated purpose. The actual development of metaphor follows the usual rule—from the concrete to the abstract, but here again both meanings are probably in mind simultaneously. The inappropriateness in this case is due again to the lack of preparedness on the part of the listener, for preparedness would presuppose acceptance of the premises and so do violence to the discriminative functions. Here again the disorder in thinking is seen only along topics of special importance to the genetic dynamic understanding of the personality disorder. The material is more extensive and more logically knit.

In both types of thinking disorder there was remarkable preservation of mental activity as reflected in the language, both spontaneous and conversational, concerning neutral topics. It appears that on these issues of genetic-dynamic importance, vital personal issues, language is no longer the vehicle for clear, unambiguous communication with others but is used in an autistic way, doubtless at times bringing its own gratifications and sense of sufficiency.

A brief summary of the principal problems and the diagnostic formulations may be made:

*Group I.*—CASE 1.—The problem was injury to the eye and shortness of stature, which were felt as blocks to the achievement of the ambition to fly. Loss of "perspective" and difficulty in estimating distance had long ago been stressed by the patient's physician as preventing him from taking part in sports.

The diagnosis was adolescent resentment and paranoid projections, with mixed feelings of inferiority and superiority and mystic attempts at a solution of the trouble; probably a parergasic reaction, with suspicion, hostility, vindictiveness and annoyance.

The outcome was suicide.

CASE 2.—The problem was the patient's growing realization of his inability to live up to the family tradition and expectation, guilt over masturbation and paranoid ideas.

The diagnosis was parergasic reaction, with paranoid features, and suspicion, insecurity and fear.

The patient was still in the hospital (two years after the onset) and had improved.

CASE 3.—The problem was the defeat in love, with the patient's refusal to accept the finality of the decision, the feeling that he was not living right and needed the companionship of a woman and a desire for salvation from sin and his love problem.

The diagnosis was acute parergasic episode, with preoccupation and tension, followed by an ecstatic experience of salvation.

The patient recovered.

CASE 4.—The problem was the patient's lifelong feeling of insecurity with her family, husband and co-workers; failure to gain the approval of her fellows; alleged discrimination because she was Jewish and in love (autistic) with her employer, and the feeling of duty to protect the government for which she worked.

The diagnosis was parergasic reaction, with ideas of cosmic control and of reference, and suspicion, fear and hopelessness.

The patient is still in the hospital and has not improved.

Group II.—CASE 5.—The problem was marital insecurity, resulting from the husband's attacks of anxiety, with advice from the physician to secure divorce because of the poor sexual adjustment; concern over the lack of orgasm; suspicion of the husband and reduction of social activity, in a frenzied quest for greater marital stability, and confusion.

The diagnosis was parergasic reaction accompanied by acute episodes with obsessive double meaning, multiple orientation and lack of recognition of relatives, and suspicion, insecurity, tension and panic.

The patient recovered and separated from her husband.

CASE 6.—The problem was the patient's failure to establish the right to membership in the Daughters of the American Revolution; discovery of moral laxity in her ancestors and chagrin thereover; the feeling that she was the object of unfavorable local gossip, and the establishment of a new and more significant heredity from the lost tribes of Israel.

The diagnosis was paranoid reaction (probably late parergasic?), with chagrin, resentment, suspicion and tension.

The patient went home with the condition unchanged, but at the time of writing she is not a menace to herself or to others.

The problems have always to do with a feeling of frustration in needs, ambitions or desires and attempts to circumvent threatened disaster—social, intellectual, material, sexual or religious. The problems occur in a setting of impure transitive affects—tension, resentment, chagrin, suspicion, anxiety, fear, panic and ecstasy—congruous with



the content. The resulting behavior is of the "para" type, i. e., twisted, bizarre and out of the ordinary run of experience. This is no mere coincidence and imposes reservation as to the essential, diffusely affective nature of the condition in the following case, which was not included with the cases already described because of the slightly different treatment of metaphor:

CASE 7.—A man aged 28, who had been in the hospital twice before with manic-depressive attacks, returned again in a manic state after an intense study of philosophy, psychology and sociology, preparatory to entering a theological seminary. In the hospital there was a swing to depression with suicidal ideas and then with a plan to disappear and to let it be thought he had committed suicide, in order that his wife might gain the insurance. There followed quickly shifting moods from depression to elation and vice versa. In this phase he was found standing on the veranda, gazing at the second floor windows. He asserted he had thereby gained the "*point of view*" of a nurse whom he had seen standing in this manner at the time of his first admission to the hospital. There was much preoccupation with this nurse, as during the second stay in the hospital, and he harbored an ill defined idea of being in love with her. At the time of his first admission, at the age of 22, while in a manic attack, he talked of experiencing electric feelings, but not in the sense of real passivity. He linked God and love with electricity. He was immature, emotionally unstable and irresponsible, with ambitions beyond his reach, and was dissatisfied with the disciplined life he carried easily.

In this case the reservations to be attached to the diagnosis of thymergasia probably are to be taxed to the poor organization of the personality rather than to its disorganization. The metaphorical abuse probably resulted from empathy run wild to the point of identification, but again showing evidence of egocentric thinking.

The literature on schizophrenic thinking and language reduces itself to two main currents of thought: (1) the organic, which sees the difficulties as peculiar, but essentially athematic, the result of damage to the brain, of a kind still to be disclosed, and (2) the developmental, which sees in the difficulties a reversion to more primitive modes of thinking and speaking. The latter may be an integral part of the former, simply answering the question "how," where the former answers "why," as Vigotsky<sup>4</sup> asserted.

The material of this study leads only to a direct denial of the athematic contention, since in every case the disorder in language was in immediate connection with factors of life, experience and personality significant for the understanding of the development of the peculiar individual reaction called parergasia. In case 1, for example, the patient never showed any other peculiarity in language than the one instance, which epitomized the patient's life tragedy and his interpretation of his

4. Vigotsky, L. S.: *Thought in Schizophrenia*, translated by J. Kasanin, Arch. Neurol. & Psychiat. **31**:1063 (May) 1934.

needs. The study of such early stages offers a key to a dynamic interpretation no longer available in older or more advanced forms showing diffuse dilapidation of language. The difficulty in the analysis of neologism illustrates the point. When disorganization has proceeded to this degree, original dynamic factors may be difficult to elicit or forever lost.

The peculiar breakdown of logical thought and language along special lines of cleavage has its counterpart in blocking in connection with special catathymic topics in some types of depression. Neutral topics may be well handled, as in the cases described in this study and in those of catathymic depression, or the disorganizing or the blocking process may extend progressively to all language and to other psychomotor expression. Even schizophrenic scattering of thought and its resultant scattered, irrelevant, incoherent language may be present only, or largely, along special lines of cleavage, clearly demonstrable as long as the patient's attention is held, but likely to appear diffuse when the attention flags and escapes.

Why does language (and thought) break down in such emergencies? Common experience with intense preoccupations with strongly affective coloring, especially the projective affects of hate, anger, fear, puzzle, aggressive desire and submissive sensitivity, shows logical thought often to be clearly impossible, the talk becoming irrelevant, fragmentary, repetitive, reduced to interjections or entirely, if transiently, stopped. In the cases described in this study formal construction was maintained at the expense of the reasonableness of the content through the partial or the complete substitution of concrete for abstract symbolization.

Why does the difficulty show diffusely in so many cases? A completely satisfactory explanation is not at hand, but the conception of habit deterioration as applied to habits of thinking must be entertained as basic. The rôle of the gratification to be derived from the use of language in an autistic fashion appears to be important.

The abuse of metaphor in the first group of cases consists in the reversion to concrete thinking, as seen in children and more primitive people. In these cases, however, in contrast to those of Storch<sup>5</sup> and von Domarus,<sup>6</sup> data are presented within the easy grasp of every one and make unnecessary the resort to ethnologic comparisons and hypotheses derived therefrom.

5. Storch, A.: *The Primitive Archaic Forms of Inner Experiences and Thoughts in Schizophrenia*, translated by Clara Willard, *Nervous and Mental Disease Monograph 36*, Washington, D. C., Nervous and Mental Disease Publishing Company, 1924.

6. von Domarus, E.: *Praelogisches Denken in der Schizophrenie*, *Ztschr. f. d. ges. Neurol. u. Psychiat.* **87**:84, 1923; abstr., *J. Ment. Sc.* **70**:310, 1924.

The disorder of language noted in the cases of this study is an integral part of the "para" type of behavior, and the reasons for its special characteristics must be the same as those for the "para" reaction. These still are dimly visible and cannot be reduced to any known simplicities, psychobiologic or physiologic.

It seems clear that the pathologic use of metaphor in these cases consists of a deficit in the social value, language becoming the servant of autistic thought and leading to or reflecting appropriate action, or at times becoming the end in itself and furnishing its own gratifications.

#### SUMMARY

Cases are reported illustrating the psychopathic use of metaphor in spontaneous speech. The disorder consists in (1) the use of terms maintaining overtly the customary figurative sense, but actually used in the concrete sense—the latter corresponding to the original, and no longer current, use of the term—and (2) the abundance of new coinages without formal disturbance, as in the first type, but in which the metaphor cannot find easy social acceptance because of the violence done to the unbiased judgment.

The metaphorical abuse is exclusively in connection with material vital to the genetic-dynamic understanding of the personality, occurring along special lines of cleavage dealing with frustrations in a setting of the transitive affects of chagrin, fear, ecstasy, resentment, suspicion, etc. Under such conditions there occurs concrete in place of abstract thinking.

The athematic, "organic" character of the thinking disorder is refuted by these cases.

Metaphorical abuse is an expression in the patient's thinking and language of the loss of social value and the resort to autistic gratification.

## AVERSION AND NEGATIVISM

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Negativism is a well established psychopathologic reaction signifying the negativistic behavior of patients with schizophrenia to stimuli from the environment (outer negativism), as well as to impulses from within (inner negativism). It was first described by Kahlbaum as the motor negativism which is seen in patients with catatonia. Later, especially through the work of Bleuler, this term was expanded to cover all negativistic reactions associated with schizophrenia. Bleuler<sup>1</sup> agreed with Kraepelin that no intellectually understood motives play a part and stressed the "instinctive" or "impulsive" character. He therefore denied that affective factors play a dominant rôle. He formulated negativism as a secondary schizophrenic symptom in which ambivalency and ambivalence, the schizophrenic splitting, lack of clearness in thinking and imperfect logical thinking, autism and negative suggestibility are important dynamic factors. This formulation is generally accepted, except by the remaining school of Wernicke (Kleist<sup>2</sup>) and some Italian authors who seek an organic basis for the motor negativism.

Negativism does not include the emotional reaction of being unwilling or unable to accept a situation. Bleuler always stressed this point in his teaching, although it did not appear clearly in his publications. This emotional reaction, which is found in daily life and in marked intensity in many psychoses, is primarily of the affective type. It has not been discussed in the literature, although it has been remarked on by many authors. For this affective reaction the term "aversion" is proposed.

In studying the unbending and uncompromising attitude of some depressed patients, Adolf Meyer used the term "aversion" during my association with him. It implies an aggressive emotion, as expressed in the English term when it means dislike and antipathy and individual unwillingness to do something. Disgust in varying degrees may be present. Strong dislike and even resentment, reaching often the degree of intense hate, are most frequent. Dissent and want of interests may lead to aversion, meaning then declining, refusal or rejection. With

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From the Payne Whitney Psychiatric Clinic, the New York Hospital.

1. Bleuler, E.: *The Theory of Schizophrenic Negativism*, translated by W. A. White, Nervous and Mental Disease Monograph 11, New York, Nervous and Mental Disease Publishing Company, 1912.

2. Kleist, K.: *Gegenhalten (motorischer Negativismus), Zwangsgreifen und Thalamus opticus*, *Monatschr. f. Psychiat. u. Neurol.* **65**:317, 1927.

the development of the active emotions of dislike, resentment and hate, the reaction of aversion appears. Gross,<sup>3</sup> in studying negativism stressed that one frequently finds the emotional factors expressed in *Ablehnung* (rejection, refusal). The description and clinical study of some of his patients were excellent, but he did not draw the necessary conclusions and tried to fit the picture into that of negativism. Bleuler rejected this. As far as I am aware, the word "aversion" was used for the first time by Tuke,<sup>3a</sup> in translating Griesinger's term *verabscheuen*, when he stated that the mood of patients with melancholia may assume an entirely negative character. *Verabscheuen* means "to abhor" and "to detest."

In discussing negativism Bleuler stressed that it is the opposite of automatic obedience and is often combined with it. He seemed, therefore, to imply the automaticity of the reaction. He stressed that one deals with a defense mechanism, a protection of the person's "life wound," and that contrast associations and contrast drives, on the basis of ambivalency and ambitendency, are working freely. He expressed the belief that sexuality plays a considerable rôle but was unwilling to accept Jung's thesis<sup>4</sup> that resistance which originates from complexes and is therefore always derived from a special type of sexual development is the dynamic factor. It seemed to him that there must be a more elementary process which has a structural basis in the brain. In this respect, he was returning to the formulation of those who believe in a neurogenic basis of motor negativism.

In recent years attempts have been made to study negativism from a more dynamic point of view, but no cases have been reported in which an entire analysis was made. These authors stressed the relation to sexual desires; for instance, the negativistic attitude is considered to be the result of overcompensation of sadistic and sadomasochistic factors.

In contrast to negativism, in an aversion reaction the patient is aware of his motives. He recognizes his strivings more or less clearly and carries them out. Whether this is done purposely or willingly is a matter of definition. One does not mean to imply that the patient is always aware of the real dynamic factors. They may be dissociated, but his emotional reactions are intelligible to him and in accordance with the situation. In contrast to automatic negativism, which is primarily due to or connected with dissociated factors in a submissive personality setting, aversion occurs most readily in a self-assertive personality. Both

3. Gross, O.: Zur Differentialdiagnostik negativistischer Phänomene, Psychiat.-neurol. Wehnschr. 6:345 and 357, 1904-1905.

3a. Tuke, D. H.: A Dictionary of Psychological Medicine, Philadelphia, P. Blakiston's Son & Co., 1892, vol. 2, p. 832.

4. Jung, C. G.: Kritik über E. Bleuler: Zur Theorie des schizophrenen Negativismus, Jahrb. f. Psychoanal. u. psychopath. Forsch. 3:469, 1912.



are reactions of protection, but negativism is of the weaker type. Aversion reactions may occur in daily life and be expressed by resentment and hate. In psychotic reactions this affect becomes more intense, or even sweeping. In fear and panic, in which the patient is especially in need of protecting himself, aversion to outside interference is especially marked. It is also frequent in anxiety states, especially in anxiety depressions and involuntional melancholia. It may be one of the mood reactions in paranoic developments. On the other hand, aversion to environment in predisposed persons may lead to suspiciousness and paranoid projections. In formulating aversion reactions as psychopathologic manifestations, one should, however, guard against expanding this term to the extent that it includes any unwillingness on the patient's part to face a situation or an experience, although the dynamic factors involved may be the same.

CASE 1.—An aggressive, self-reliant man aged 44, who was unwilling to accept obstacles as unsurmountable, reacted with obvious tension and sleep difficulties to promotion to sales manager for a large concern. Shortly after his appointment, his staff was curtailed, owing to the business depression (November 1933). In March 1934 he experienced definite depression, with sluggishness of thinking in the morning. He tried to overcome these difficulties by increased effort. In June 1934 there developed anxiety, which was expressed primarily in gastric complaints, loss of self-confidence and increased difficulties in thinking. Marked indecision developed. The anxiety seemed to be caused by general tension and self-blame for not being able to live up to his standards. Although he became increasingly agitated, he worked until the day of his admission to the hospital (October 1934). In the clinic he presented the same picture. His outstanding mood was resentment toward being ill, toward having to be in a psychiatric hospital and toward having the routine of living outlined to him. The depressed mood was usually hidden behind aggressive irritability. He was often unwilling to cooperate and freely expressed dislike for the activities in the hospital. Every day these features were most marked until about noon. He was unwilling to offer any complaint with regard to his health, always centering on the unacceptable situation.

This man had been successful in positions in which activity and aggression were most important (first as salesman, later as head of a farmers' corporation and for eight years as assistant sales manager). His position at the onset of his illness demanded much detailed attention, as well as executive direction. He always tried to achieve perfect results, but this was impossible in the higher position, especially when he had to combine the position of manager with that of assistant manager, owing to the necessary curtailment of the staff. He was unwilling to bend to the difficulties which arose in his situation and to modify standards of perfection in detailed work. He was uneasy about not being able to perform his former duties as well as previously, when he had one position instead of two. There was a marked unwillingness to recognize his emotional limitations for the higher position. He showed considerable rigidity in dealing with others and was unwilling to modify his high expectations. When well he was a soberly cheerful person. No depressive constitutional factors seemed to play a rôle in his heredity.

The clinical picture remained that of an agitated depression, with an unpromising attitude to illness and the hospital. He was unwilling to admit obvious improvement in his depression, which became noticeable after about two months.

Hospital treatment was indicated because of suicidal dangers and his unwillingness to accept medical treatment outside. In prescribing his daily activities attention was paid to an individualized modification of the routine of the hospital. Small amounts of barbiturates relieved the agitation only slightly. A four week course of treatment with tincture of opium helped more, but the patient's resentment at having to take this medicine caused irritability and an increase of the anxiety, to alleviate which the tincture of opium was prescribed. The first psychotherapeutic task was to establish a healthy rapport with the physicians and nurses. This was achieved through discussion of neutral topics and avoidance of contradictions and arguments. The patient began to accept the members of the staff as individuals but declined to consider the necessity of their professional help. On one occasion difficulties arose with the physician who prohibited the wife's visits for two weeks because of the patient's continuous effort to convince his wife of the necessity of removing him from the hospital and because her refusal increased his agitation considerably. Afterward it was possible for her to resume her visits without the previously disturbing emotional reaction. Whenever I saw him in the morning, his resentment was the conspicuous mood reaction; this was occasionally modified when I saw him in the afternoon. I considered this an encouraging sign, as it pointed to a diurnal variation in mood of a depressive character and a certain dependence of his resentment on the underlying depressive mood. A good prognosis was therefore offered to the patient and his wife. I mentioned this only casually to the patient, however, and avoided stressing it to the extent which would have irritated him and disrupted our rapport. Sugar tolerance tests of the blood, which were carried out at intervals of two weeks, illustrated the varying intensity of the mood of resentment.

In March 1935 a therapeutic transfer to a small private hospital was advised. The patient had been anxious to have more opportunity for walking and accepted his wife's suggestion of the new hospital, although somewhat grudgingly. This hospital seemed more like a home than a hospital. His depression was far less marked, and I did not feel that suicidal factors played a strong rôle any longer. Resentment seemed to be due primarily to his attitude of undiminished aversion to being in the first hospital. His difficulties in thinking had disappeared to a large extent, and he was therefore able to keep occupied spontaneously. This was an important factor in consideration, as the private hospital lacked well planned occupational facilities. In his new hospital environment the patient's resentment diminished considerably, and he was discharged after two months. On my invitation the patient returned willingly for an interview in September 1935, for it offered him an opportunity to show that he had improved as soon as he had left the first hospital. He returned later for a few more interviews, during which I studied his reaction of resentment. A slightly paranoid attitude developed toward the president of his firm, who did not wish to reappoint him but, on the other hand, was unwilling to express this clearly and avoided making a decision until December 1935. Through the therapeutic discussions this paranoid attitude was considerably modified, and the patient secured a position with another firm for which he was well suited.

From these discussions it became obvious that the patient's reaction was due largely to his inability to understand the nature of his illness and how to deal with his difficulties. During his illness he lacked "pep" and fretted against his difficulty in making decisions and his inability to enjoy his work as he had previously. He resented his superior's avoidance of making decisions and missed the preceding manager's helpful advice. His pride and stubbornness did not permit him to turn to others readily. He had felt the strain of this struggle in the spring of 1934,

but was unwilling to accept the difficulties and tried to overcome them by increased work and the omission of recreation. An increasing dislike for his work developed. Admission to the hospital and treatment were resented because it demonstrated that others had also become aware of his inability to manage his own affairs and to take care of himself. He resented the separation from his wife, who had been his closest confidante for years, and felt that the physician forced himself between them. He constantly fretted against his inability to think clearly and to find his way out of his condition. When well he enjoyed struggling with obstacles; while ill he could not succeed along any line.

#### TYPES OF AVERSION AND THEIR DYNAMIC FACTORS

Aversion to situations or to persons may affect the psychopathologic picture considerably. The resulting emotional reactions of dislike, resentment and hate may become dominant and overshadow an underlying mood disorder. The probable factors which are connected with these impure affects may become the center of preoccupation, and a fixation of affect on these topics may result. The originally fundamental factors may become less important for the time being. When fixation of affect develops, an apathetic or withdrawn attitude may result, from which the patient may not recover. Owing to the attitude of aversion to the unacceptable situation and to the persons who are obliged to help the patient, irritability, outbursts of anger and even combativeness occur. In other cases stuporous reactions result. They are usually brief, if treated correctly. On the other hand, they may last for a considerable time, especially if they occur in the setting of a poorly organized personality. In one of my cases it lasted for a year and a half.

Resentment toward having an illness which the patient felt was disgraceful to a strong personality and against the treatment involved was the outstanding mood and constituted the psychopathologic reaction of aversion in case 1. Resentment is closely related to dislike and hate. It expresses the person's mood toward being unable to conquer a situation or a person and is frequent in self-assertive and unbending persons who are unable to accept certain situations or persons. When self-assertion is of a weak type, resentment may express itself in sullen behavior and obstinacy. In aggressive, self-assertive persons it expresses itself freely and may easily lead to paranoid projections. The close relationship of resentment to the aversion reaction and to paranoid projections is well seen in this case. Aversion which expresses itself in resentment may be directed to an illness which interferes considerably with one's life or which is unacceptable to the person. Such resentment occurs frequently when guilt factors play a rôle. Many other factors may be important. In psychopathologic conditions one deals most frequently with a patient's resentment to having an illness which he feels he should be able to manage himself and which means to him a weakness.

Dislike and hate are other emotional reactions which lead to aversion. Disgust may also be a factor. Guilt may cause a person to react with aversion to his own self, expressed in feelings of dislike, hate, resentment, anger or disgust. When the guilt factors are less clear to the patient, the same mood may result without definite content, as is best seen in anxiety. In others it may lead to projection of the paranoid type. As the illness progresses the reaction of aversion to the environment may become outstanding and give the illness a specific coloring.

The dynamic factors of aversion may be present in psychoanalytic negative transference and countertransference. Two factors which have been found in association with negative transference are similar or the same in forming aversion to the treatment or to the physician: defense resistances, to prevent unconscious presentations from becoming conscious in the analysis, and resistances due to feelings of guilt and need for self-punishment. When the physician's own personality becomes involved (psychoanalytic countertransference), he may react with aversion to the patient. This may be caused by resenting the patient's opposition or inability or unwillingness to proceed in gaining an expected understanding. In other physicians aversion is caused by insecurity which the patient stirs up in the sexual, especially the homosexual, realm.

It will be well to limit the term aversion to clearcut psychopathologic reactions and to avoid applying it to reactions of spite or to any kind of unrelenting behavior. There is always danger that a psychopathologic term may lose its effectiveness because it is used too freely for the psychobiologic reactions which are due to the same factors. It is essential that illness be kept separate from well-being. The psychobiologic functions have the same relation to psychopathologic reactions as physiologic functions to physical illnesses. They appear in the psychopathologic reaction, but in a modified form which makes it pathologic. One should guard against explaining psychobiologic functions and reactions from the point of view of pathologic behavior, without overlooking, however, the close and inseparable relationship between psychopathologic and psychobiologic reactions.

It is obvious that reactions of aversion may occur in all kinds of clinical psychopathologic manifestations and that they do not belong to any disease entity. In my study of anxiety, fear and panic I was frequently confronted with it. As I have described elsewhere,<sup>5</sup> the patient who is in a panic and does not know whom he can trust or to whom he may turn, may protect himself by an attitude of aversion to his environment and to people. This is also illustrated in the depressions of declining years, especially in involutional melancholia. It is essential

5. Diethelm, Oskar: The Nosological Position of Panic Reactions, *Am. J. Psychiat.* **13**:1295 (May) 1934.

that one avoid making the mistake of considering such reactions as the expression of negativism and classifying these illnesses as schizophrenia. In many reactions of fear and panic, aversion to discussing sensitive situations of one's life may be the personality's protection against stirring up something which the patient is not yet able to handle. This is the same reaction that Bleuler found in his study of negativism, when he spoke of the protection of a "life wound."

In depressions it is frequently impossible for the patient to accept the illness or the help offered. This is especially marked when disorders of thinking, often accompanied by perplexity, interfere with a clear grasp of the situation. Tendencies to be irritable, sensitive and morose rather than sad and to complain about the environment are frequently the outstanding manifestations of depression in disappointed persons. This expression of dissatisfaction with the situation and the environment may develop into frank aversion. These patients may present great difficulties in the handling of their illness, because they disturb a wholesome atmosphere in the hospital. The tendency to rut formation due to aversion which may prevent recovery has already been mentioned. In deep aversion in the setting of a depression, the patient's attitude is less affected by serious physical illnesses than in negativism associated with schizophrenia. In two patients under my observation pneumonia had no modifying influence, and a third patient succeeded in starving himself to death in a stubborn and unrelenting attitude of aversion to his illness.

In manic excitement aversion reactions are frequently shown by markedly feeble-minded persons who are unable to understand therapeutic procedures and by psychopathic persons who resent being interfered with and forced. They may also occur in self-assertive and suspicious persons who react with delusions of persecution.

In schizophrenic illnesses these reactions may be taken for negativism, while a closer study of the factors involved would reveal that there are intelligible motives and would offer an opening for therapeutic modification. This is most frequently observed in the paranoid type. In paranoid reactions in general the factor of aversion enters not as a leading but as a highly disturbing factor, which the physician should be able to meet.

In adolescents and in the poorly organized persons whom one calls psychopathic, aversion occurs readily because of the patient's inability to see the need to bend or because a mistaken type of pride prevents him from doing so. One should keep in mind, for instance, that the adolescent becomes aware of himself and of his independence and that he has a need to try himself out. During the period of emancipation an adolescent is most resentful to criticism and reacts readily with sulky and sullen behavior. There is also a tendency to be revengeful and to desire retaliation. It is therefore not surprising to find that adolescent



and immature persons show in their depressive pictures the outstanding symptoms of sulkiness, marked sensitiveness to criticism, resentfulness and revengefulness.<sup>6</sup> Owing to the still immature type of thinking, the depressive thinking disorder results readily in confusion, unreality and familiarity experiences, which bewilder the patient and increase the tendency to aversion reactions. Hate, resentment and suspiciousness are usually the expression of aversion, but the latter may even lead to outbursts of anger and combativeness.

When one considers the disorder in judgment in organic psychoses and the increased tendency to impulsive behavior, one needs to expect reactions of aversion to therapeutic intervention in these disorders. When tendencies to suspiciousness or to paranoid projection are present, these reactions occur more readily. One also should keep in mind that with old age the personality develops increasing rigidity and inability to bend, which forms an additional predisposing factor to aversion reactions.

In psychoneuroses aversion is most frequent during various phases of treatment in which the patient is confronted with material which he is unwilling to discuss or when he feels that the physician forces him into discussions or into a routine of living which he resents. One often finds marked anxiety developing in such situations. The factors involved may be manifold and not due merely to guilt or sexual fixations, as has been postulated. These two factors are, no doubt, frequent, and one should always try to determine whether they play a rôle but should not bend the facts because one is averse to bending one's theories.

#### TREATMENT

In dealing with a reaction of aversion, whether it is aversion to treatment in general, to the physician or to special circumstances, one needs to keep in mind that self-assertion and inability to bend are of importance. If the physician tries to enforce his will, it does not modify but increases the patient's dislike and resentment. This important principle causes great concern to a thoughtful physician when circumstances force him to insist on certain resented therapeutic procedures. Hospitalization and strict observation necessitated, for instance, by suicidal danger are often resented. One should therefore look for possibilities of making observation of suicidal tendencies relatively inconspicuous and of thus preventing the constant irritation caused by the feeling of being interfered with and watched. In a large hospital one ought to be able to arrange a floor where a reasonable amount of freedom can be combined with close observation. Owing to technical improvements, barred win-

6. Diethelm, Oskar: Nonorganization and Disorganization of the Personality During Psychoses, *Arch. Neurol. & Psychiat.* **29**:1289 (June) 1933.

dows may now be avoided. The outside door of the floor should be kept locked, but the other doors may be left unlocked. By designing bathrooms to suit the special needs of psychiatric patients instead of merely copying bathrooms for well persons, free access should be practicable. Certain types of glass and the use of substitutes now make it possible for hospitals to be made attractive by the display of pictures and vases. The tendency to build private rooms and to avoid open dormitories is of questionable value. Close observation can be carried out with less annoyance to a patient if he sleeps in a large room with others than when the door to his room must be kept open and frequent visits by the nurse at night are necessary. No hard and fast rules are possible. The individual personality needs to be studied if one wishes to find ways to make hospital life least irritating.

Whenever a certain type of hospital provokes a patient constantly, one should not hesitate to transfer him to a more suitable hospital. Therapeutic changes from a hospital located in a city to one in the country are frequently desirable. This is especially helpful in treating psychopathic personalities and manic and depressed patients who resent hospital restrictions.

One could dwell at length on the topic of how to prepare a patient for and how to send him to a psychiatric hospital and the therapeutically most desirable procedure of admission. These points have been sufficiently considered in discussions and publications. I wish merely to stress the need for adequate time and elasticity, in order to do justice to a patient's individual needs. Every situation which is covered by the wide term routine offers a therapeutic opportunity. Attention to all these factors is not time consuming but time saving if one considers the whole course of treatment.

A physician who wishes to be therapeutically successful must be willing to modify his opinions when it seems indicated and not be averse to recognizing the desirability of making exceptions to rules which have been to him generally useful and correct. Is it, for example, desirable in a psychiatric hospital to have all doors leading to the outside locked and all the windows guarded? Will one succeed in attracting the large groups of psychoneurotic patients who need treatment in a hospital and who now find a retreat in the private medical pavilions because they shrink from the psychiatric hospital? Mere education of the public with regard to the aims of these institutions will not be sufficient if the hospitals are not adjusted to all types of patients. Attempts at a solution have been made, but usually too one-sidedly, facilities having been created for special types of personality disorders. These remarks seem indicated if one thinks of a widespread tendency among psychiatrists to regard treatment, and especially psychotherapy, as something which

should be administered only at certain times and in certain ways. A correct consideration of all possible factors will prevent the development of reactions of aversion to treatment, or at least allow a wholesome rapport to develop between the patient and the physician.

When difficulties in establishing a healthy rapport exist, the physician should try to find neutral topics of interest. A patient who resents his illness does not wish to be reminded of it constantly. He may acquire tolerance, or even high regard, for the person, although the profession is unacceptable or offensive. The same applies to all other persons who have dealings with him.

With all these patients, but especially when perplexity, suspiciousness or disorders of thinking are apparent, every move should be explained carefully and in a form which is intelligible and acceptable to them.

CASE 2.—A man aged 44 showed marked resentment and aversion to those who had to carry out the treatment of his manic illness because his self-esteem was hurt when he was taken to the hospital by police officers and kept there in a strait-jacket. A few days later he became stuporous. Aspiration pneumonia resulting from tube feeding did not modify his reaction. When admitted to the Henry Phipps Psychiatric Clinic, after three weeks' hospitalization, the patient was "stuporous and markedly undernourished but had recovered from his pneumonia. Our approach to the patient was based on a careful personality evaluation. We realized that we dealt with a man who was very aggressive, self-confident, had a high sense of justice and resented anything which affected his dignity. One can easily see that this patient must have resented being taken from his home to the hospital by uniformed policemen and being subjected to constant restraint in the hospital instead of being dealt with on a basis of equality. In our dealings with the patient every one (physicians, nurses, and attendants) was polite and considerate. Any move which might be resented, such as tube feeding, was first explained to him carefully, and he was invited to eat each time before the feeding. A careful physical examination gave us an understanding of his somatic condition at the time and allowed the physician to formulate to the patient his state of health and to explain the necessary therapeutic measures. Due to this approach the patient developed some confidence and began to talk and feed himself after two days. Within another day he developed a full-fledged manic excitement and the treatment had to be modified accordingly."<sup>7</sup>

During the whole period of manic excitement, which lasted six weeks, and of a hypomanic phase of about equal duration, one had to keep in mind his sensitive pride and need for self-assertion. Open clashes were prevented by avoiding contradictions and arguments and by not interfering unnecessarily with his need for individuality. Only at the end of his stay was it possible to discuss with him the dynamic factors of his illness without producing an increase in his hypomanic illness. As far as his aversion reaction was concerned, the patient remained sensitive, and no further analysis was obtained beyond the fact that he resented the management of his illness, because it was an insult to his dignity and pride and seemed unjust. He did not wish to have any contact with persons in attendance and therefore became mute and unwilling to cooperate. There is no doubt that

7. Diethelm, Oskar: *Treatment in Psychiatry*, New York, The Macmillan Company, 1936, p. 157.

resentment was the outstanding emotion at that time, but what other emotions and dynamic factors played a rôle remained obscure. A certain amount of anxiety seems to have been present, which may have been related to lack of confidence in those around him.

The next case demonstrates that the correct treatment of reactions of aversion not only will shorten a distressing phase of the illness and prevent a nonrecoverable rut formation but may avert the recurrence of the aversion in a subsequent psychosis. New faith in physicians and desensitization to suffering from personality disorders for which help is needed may be established. Although the recurrent depressive psychosis was not shortened, the treatment and management were made much easier by the patient's changed attitude.

CASE 3.—A self-assertive, set and rather moody unmarried woman aged 54, who had always been inclined to suspiciousness and sarcasm, was admitted, suffering from a depression. She was proud, conventional, reserved and sensitive about her impression on others. Her father and the other siblings were of similar make-up. During her first depression, at the age of 42, and the second, at 48, both of which lasted about eight months, the patient had been averse to treatment and was irritable and angry and at times destructive. She remained rather uncommunicative and inaccessible during the whole illness. She had an unforgiving attitude to physicians in both hospitals because she felt she had not received sufficient medical attention, had been ordered around and had been treated discourteously.

In a third depression difficulties of thinking and mild anxiety were the outstanding complaints. She felt people had turned against her and were laughing at her family because "their minds were affected." For the first four days she was somewhat stuporous and shrank away when any one approached her. She was afraid, as she explained later, that she was to be burnt. She was incontinent of urine because she was afraid to go to the bathroom. Occasionally a statement of feeling depressed and unworthy was obtained. Her attitude to treatment was well expressed by seeing patients as small persons who were being punished. The tubs appeared large and frightening. This visual disturbance disappeared after two weeks, but for another two weeks she saw her physician as a much smaller person than he actually was, i. e., till her attitude of aversion to him and to treatment became considerably modified. The whole stay in the hospital lasted eight months, the last few weeks being devoted to a fairly satisfactory, constructive study of her personality.

After her discharge from the hospital, on several occasions when she felt under a strain or mildly depressed, the patient asked for a consultation with one of the physicians who had treated her during her last illness. At the age of 59 she was readmitted to the hospital, in a depression. During this whole illness, which lasted nearly a year, she had full confidence in her physicians; no symptoms of aversion appeared, and none of the symptoms which had previously impressed the physician as being paranoid in character.

Thorough study of the factors involved in the attitude of aversion should be delayed till the psychosis in which it occurs has disappeared. In a few cases only will one be able, and is it indicated, to reach an understanding of all the important dynamic factors. This should be attempted

primarily in psychoneurotic disorders occurring in a well organized personality. Whenever an attitude of aversion, of whatever kind, appears in the setting of a psychosis, one is best guided by the treatment which Adolf Meyer outlined for symptomatic paranoid states. He said:

Wherever delusions, whether systematized or not, appear on the ground of a more fundamental reaction type such as that of the elations and depressions of a non-topical character, experience shows that it is not argumentation that is most needed, or any direct attack on the delusions, but a relief of the underlying feelings which are frequently of a more or less somatic character. Especially in depressions, argument is positively irritating to most patients. What is wanted is to reach a neutral state from which the patient does not have to shrink, and in which, on the contrary, it is possible to get an unloading of the strained feelings. No definite rules can be given. In the main we attain most by a cautious substitution of neutral common interests devoid of any pressure and urging and nagging. If it is easiest to obtain that by rest and repose, it is best to accept that; in interesting the patient in some occupation, or in helping others; especially in cheering and interesting other patients one often finds that they unconsciously imbibe what they try to make others assimilate. Patience and a liberal allowance of time and continued attention to whatever can be done to facilitate a normal activity of the organs most involved in the fundamental depression will in the end give the best results. On this account it is possible from time to time to get the patient into a mood of asking questions about the topics of the delusions. The physicians and the nurses do well to show and occasionally express what their own sane standpoint is, but as a rule to leave it to implication; and they must stand on the ground that they and the patient must agree to disagree, and they must show by their actions that this is possible.<sup>8</sup>

#### SUMMARY

In contrast to negativistic reactions, with their automaticity and absence of sufficiently intelligible motivation, aversion reactions are characterized by emotions and motives which make them intelligible to the patient and to others. The outstanding emotions are resentment, dislike, hate and disgust. Aversion is the reaction of an unbending personality to an unacceptable and unconquerable situation. While negativism is the expression of autism and submission, aversion seems to be related to aggression and self-assertion. The psychopathologic picture varies individually, the most frequent aversion reactions being sullen or resentful uncooperativeness, stuporous and paranoid conditions and nonrecoverable rut formations in association with depressions in the involutional and later periods of life. By studying the factors which cause aversion the physician will frequently find ways to make the situation more tolerable to the patient and modify an unbending attitude by treatment.

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8. Meyer, Adolf: *The Treatment of Paranoic and Paranoid States*, in White, W. A., and Jelliffe, S. E.: *Modern Treatment of Nervous and Mental Diseases*, Philadelphia, Lea & Febiger, 1913, vol. 1, chap. 14, pp. 659-660.



# RELATIONSHIP OF DECLINING INTELLIGENCE QUOTIENTS TO MALADJUSTMENTS OF SCHOOL CHILDREN

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BALTIMORE

From time immemorial it has been an empirical fact of lay and clinical observation that constitutional endowment is a definite factor in predisposition to poor mental health. Prior to what one might characterize as the mental hygiene movement, the negative aspects of this fact were alone emphasized. Progeny of psychotic patients or nervously unstable persons waited for the inevitable. The advancement of chemistry, bacteriology and endocrinology carried the hope that the determinants of transmission would be revealed. With the blasting of this illusion (except in the minds of some of the faithful, who still look for deliverance at the hands of biochemistry), the messianic hope formulated itself in a psychotherapeutic approach. This started with the modest goal of urging that the personality aspects of growth and development should be considered of equal importance with the intellectual and the biologic set-up. From this the trend has developed to a belief that in the complexities of childhood personality alone lies the key to all maladjustments except, of course, those due to obvious lesions and to so-called feeble-mindedness.

Naturally, the pediatrician, the public health physician and other physicians who deal primarily with child welfare have come to feel that the mental hygiene aspect of their work is accounted too deep for them to understand and have a part in. This is one of the reasons that leaders in pediatrics have been critically outspoken toward the child guidance movement and that child guidance as a movement has suffered a slump in the last five years. It is my purpose in this paper not to enter on a discussion of psychologic and psychoanalytic trends in the study and treatment of behavioristic difficulties of childhood but to stress once more the fact that no one can exercise good judgment in the guidance of childhood and adolescence unless he carefully utilizes every scientific help at his disposal in finding out what is any given person's best level

for adapting himself to life with a reasonable degree of satisfaction and equanimity.

The first worker to develop and continuously emphasize this fact was Adolf Meyer. As far back as 1903, in discussing a paper by G. Stanley Hall, he wrote:<sup>1</sup>

The progress of psychiatry during the last decade has clearly shown that what we need is to turn from generalized attitudes to a conscientious observation and careful valuation of actual facts to definite chains of causation, if we wish to learn something. . . . Constitutional inferiority represents the persistence or cropping out of signs of defect in one of the many directions of human development, as evidence of poor endowment, or of scars produced by disease or mismanagement in early childhood. . . . Before all you must free yourselves of the idea that insanity is something utterly different from simple nervousness, lack of balance, and so-called nervous breakdown. . . . The types of adolescent deterioration can very largely be traced to disharmonies of thought, of habits, and interests which bring about stunting in one direction or another. . . . Before all I miss a sense for actuality, a living with life as it is and enjoying the opportunities that are within reach.

And again, in speaking at the National Conference of Charities and Correction, he said:<sup>2</sup>

It is in one respect a comfort, although to those concerned a matter of distress, that mental disorders depend to a very large extent on heredity and predisposition of the stock. This is significant not only for eugenics, but also for the proper education of children and the choice of their careers and the need of hygienic precautions. Preventive work must not be too vague and diffuse. . . . Finding the right level of occupation and aspiration is the great difficulty in the hereditary cases, and equally so in those whose trouble is not necessarily on a hereditary foundation. Too many people aspire to positions, or are driven into positions which may be too hard for them to fill; a certain amount of success is as much a need for our health as our food and clothing and shelter. . . . Let us encourage teachers to teach pupils to do what they can do, both in work and in recreation, and rest, instead of making them the half-obedient servants of a system often killing the native interests and inculcating habits of serving time, rather than doing their work efficiently.

Again, he stated:<sup>3</sup>

The study of the constitutional makeup turns very largely on the question of the extent to which various features are determined by heredity and growth and

1. Meyer, Adolf: Arrest of Development in Adolescence, *Proc. Nat. Educ. A.*, 1903, pp. 813-815.

2. Meyer, Adolf: Where Should We Attack the Problem of the Prevention of Mental Defect and Mental Disease? *Proc. Nat. Conf. Char.* 42:298-307, 1915.

3. Meyer, Adolf: The Approach to the Investigation of Dementia Praecox, *Chicago M. Rec.* 39:441-445, 1917.

immutable, or determined by heredity and growth and modifiable, and what inside and outside factors can be expected to have functional and ultimately a structural effect.

These statements are as pertinent and forceful today as when they were made over twenty years ago. Equally true is the fact that the differentiation between "immutable" and "modifiable" has not yet been attained, nor has prevention been found amenable to any one line of therapeutic approach. The conquest of the unknown is still ahead, with plenty of opportunity for team-work on fact finding to help each child discover his best level of adaptation. Without this there can be no sound guidance.

In this paper I shall present a body of facts which seem to show a definite relationship between declining intelligence quotients and behavioristic difficulties in children confronted with school loads beyond their real ability. In meeting teachers of public and private schools over a period of many years, I have been impressed with their general belief that a child with an intelligence quotient of from 90 to 100 is normal intellectually, that he will always maintain this ratio (regardless of whether he was aged 6, 10 or 14 when the test was made) and that he can be expected to carry the regular school load into high school. When the student begins to fall back in his work in junior high school, or even before, the treatment accorded is promotion on trial, tutoring, summer school to make up subjects or repetition of grades. The suggestion that he be transferred to a vocational or prevocational school is met with almost horror on the part of principals and the remark: "No, indeed! He's not bad enough for that."

Evidently, intellectual limitation is not considered by teachers as a serious factor unless it is severe enough to fall into the category of feeble-mindedness. Continuous failure in school work, with increasing manifestation of its resultant personality reactions, is not warning enough. The reactions may be expressed in tearfulness and depression, poor sleep, seclusiveness, temper storms, truancy and the appearance of lying and stealing and even by episodes of bewilderment and panic, with amnesia for the oddities of behavior, or gastro-intestinal and cardiovascular symptoms of anxiety states.

Teachers are not alone in their failure to grasp the behavioristic significance of these reactions. Such a maladjusted boy or girl, when taken to a mental hygiene clinic, is not infrequently studied and treated from the standpoint of personality maladjustment per se, i. e., parent fixation, sibling jealousy, frustrated adolescent libido or inadequate recreational outlets. As a matter of fact, hardly a youngster grows up in a home who is not confronted with some or all of these problems. The question is: Why should this particular child at this particular

period of his school life succumb to one or more of these strains? The psychiatrist takes the word of the staff psychologist that "John ought to be able to do his seventh grade work without difficulty. He has an intelligence quotient of 95, and that falls within the range of normal." In a comparatively recent article on behavior disorders in 1,000 school children studied at the Child Guidance Home in Cincinnati, Lurie<sup>4</sup> reported:

Only 15.7 per cent of the children were definitely feeble-minded; 17.8 per cent were borderline cases of probably mental defect; 22.5 per cent were of sub-normal intelligence, and 44 per cent were either of normal or superior intelligence. These figures should help to dispel the belief so widely prevalent, especially among the laity, that the majority of problem children are either feeble-minded or severely mentally retarded.

Lurie gave the following tabulation of percentages arranged according to the common psychologic classification:

I. Q.	Rating	No.	Percentage
110 and above	Superior .....	85	8.5
90-110	Normal .....	355	35.5
80-90	Subnormal .....	225	22.5
70-80	Borderline .....	178	17.8
63-70	High grade moron....	65	6.5
58-63	Middle grade moron...	28	2.8
50-58	Low moron .....	28	2.8
25-50	Imbecile .....	36	3.6
0-25	Idiot .....	0	0
Total .....		1,000	100.0

One notices in this tabulation that the highest percentage of behavior difficulties occurred in the so-called normal group, with intelligence quotients of from 90 to 110, and that the bulk of all cases fell in the group of children with intelligence quotients of from 110 to 70. Lurie stated that the chronological ages of this group ranged from 6 to 13 years. He did not say how many times these children had been retested in the course of observation, but he stated that "deviations in the intellectual status accounted for only 83, or 8.3 per cent, of the problem cases of this series," adding that this group of intellectual deviations "includes problem cases due to superior as well as to inferior intelligence." There was nothing in this paper that indicated the actual performance of these children in their school work or anything about the complaints for which they were brought for observation and treatment.

4. Lurie, Louis A.: The Medical Approach to the Study of Behavior Disorders of Children: A Critical Analysis of One Thousand Cases Studied at the Child Guidance Home, *Am. J. Psychiat.* **91**:1379-1388, 1935.

One may turn aside for a moment to gather together a few essentials which psychology has contributed concerning the stability of the intelligence quotient as an estimate of intellectual ability. The intelligence quotient, in plain words, means the relation between a child's intellectual development and what one should expect of him at his chronological age. It is impossible within the scope of this brief paper to do justice in detail to the literature existent on the intelligence quotient, with its statements and contradictions by equally reliable workers. I shall report a reasonable consensus. Freeman and Stenquist in 1920, in testing several hundred children, reported a marked variation in the intelligence quotient, with losses and gains which were not substantiated by subsequent writers. The work of the latter group was summarized by Rugg and Colloton<sup>5</sup> in 1921, with the following conclusion:

Much confidence can be put on a single I. Q. if the examination is made by experienced and well-trained examiners who use rigorously the standardized procedure for giving the tests.

Terman<sup>6</sup> in the same year said:

It is a fairly safe prediction that the child who has been competently tested by the Binet scale and found to have an I. Q. of 75 will never attain an I. Q. of 125, or that an I. Q. of 125 will never, barring definite nervous disease, drop to 75. . . . These predictions are of course very rough, but it is worth something to know that in general there is ever a tendency for the superior to remain superior, for the average to remain average, and for the inferior to remain inferior.

It is interesting to note that Terman in 1919<sup>7</sup> said:

The greatest tendency to gain appears with the average group and the next greatest with the dull. . . . It makes little difference whether the child was bright, average, or dull, how long an interval separated tests or what the age of the child was at the earlier test.

Cattell,<sup>8</sup> reporting work at the Harvard University Growth Study, stated:

The present findings indicate that those pupils who start school with I. Q.'s above the average, not only increase in mental ability at a rate sufficient to keep the proportion between the life and the mental age the same, but at a more rapid

5. Rugg, Harold, and Colloton, Cecile: Constancy of the Stanford-Binet I. Q. as Shown by Retests, *J. Educ. Psychol.* **12**:315-322, 1921.

6. Terman, Lewis: Mental Growth and the I. Q., *J. Educ. Psychol.* **12**: 325 and 401, 1921.

7. Terman, Lewis: *The Intelligence of School Children*, Boston, Houghton Mifflin Co., 1919, pp. 140-146.

8. Cattell, Psyche: Constant Changes in the Stanford-Binet I. Q., *J. Educ. Psychol.* **22**:544-550, 1931.



rate, causing the I. Q. to rise, while the dull child's mental age falls relatively to his chronological age causing a drop in the I. Q.

This is contrary to the findings of Terman and of Rugg and Coloton, but it was corroborated by Garrison,<sup>9</sup> who found a slight increase in the higher classes, and by Burt, Doll and others, who found a decrease in the intelligence quotient of subnormal children. Kuhlmann<sup>10</sup> said:

It has been known for some time that the I. Q. as found by tests that give correct mental ages at all mental levels does not remain constant throughout successive years, except for children with an initial I. Q. of 100. Intelligence quotients below 100 tend to decrease, and above 100 they tend to increase as the child grows old.

Stanford University and the Harvard University Growth Study groups differed in their findings concerning the intelligence quotients of gifted children.<sup>11</sup> The Stanford findings pointed toward a decrease in the intelligence quotient with age, while the Harvard studies pointed to an increase.

In drawing conclusions from this literature, I find that three things stand out: (1) Precocious children remain superior in intelligence, with a certain amount of fluctuation; (2) intellectually inferior children ranging from dull normal to out and out feeble-minded remain intellectually inferior, with slight fluctuation, and (3) there is uncertainty regarding the fate of children with what some psychologists call "average" and others call "normal" intelligence, with intelligence quotients ranging, according to accepted psychologic classification, from 90 to 110. Yet this is the group in which child guidance finds its greatest problems. Why is this? Can psychology aid? I confess that I miss in psychologic literature on the constancy of the intelligence quotient sufficient discussion of the relationship between intelligence and the intellectual growth curve as applied to school work, which is, after all, the child's job. What is an intelligence quotient adequate to cope satisfactorily with an average high school academic course or a high school commercial course, and (aside from individual interests) children with what range of intelligence quotients should be steered toward vocational school? As I see it, normality, or an intelligence quotient of 100, implies the expectation of a constant increase in intellectual growth with each year of child age. Yet there is apparently great confusion in the reports of excellent workers on this point. Until it is cleared up, it seems to me that the intelligence quotient as a working concept in education is of comparatively little value to large groups of children

9. Garrison, C. S.: *J. Educ. Psychol.* **13**:307-312, 1922.

10. Kuhlmann, F., in *Educational Test Bureau*, Minneapolis, 1923, p. 118.

11. Cattell, Psyche: Do the Stanford-Binet I. Q.'s of Superior Boys and Girls Tend to Decrease or Increase with Age? *J. Educ. Research* **26**:668-673, 1933.

if it is expected to clarify the relation between a child's intellectual development and what one has a right to expect of him at any given age. The clinician of child health finds himself asking: Of what use is an elaborate classification of nine stratifications of intelligence if there is no correlation with school work, from which so much trouble with "nerves" and "badness" arises? Is there anything in the general reactions of the child during his early school years in connection with attention span, play behavior, emotional immaturity, etc., that would lead one to follow with more frequent retesting the boy or girl whose first or second grade intelligence quotient falls within the range of "normal"? It is in a study of the integration of etiologic factors of possible latent constitutional defects, as well as the personality anlage, that the safest procedures of investigation lie.

#### MATERIAL

I shall report twenty cases in which the child has been followed for periods ranging from four to fifteen years.

The children varied in age at the initial contact from 3 years and 9 months to 11 years and 7 months. They were taken as samplings from a variety of backgrounds. Some were children from private schools, with every advantage of social security, good homes and educational opportunities, and some were from good homes in moderate circumstances and with public and parochial school backgrounds; others were children from broken homes who were placed in boarding homes under the supervision of good child-placing agencies or in excellent institutions which send their children to the schools of Baltimore. In every instance the physical condition of each child was adequately cared for with respect to nutrition, the eyes, ears, nose and throat and posture, speech, etc. The institutional children came from institutions which have well trained social workers on the staff, with paid pediatric consultants, recreational workers and a dietitian. All were white children. The number twenty was chosen not because material gave out but because of the limitation of space. In short, the stories of these children represent not selected material but average samples of behavior portraits that come to the psychiatrist in private and dispensary practice.

#### METHOD OF STUDY

The cases are described from the standpoint of chronological age, complaint problem, social data, somatic facts, intelligent quotient and school grading, intelligence age, temperamental characteristics and subsequent data. The term "intelligence age," instead of the usual term "mental age," was used because the word "intelligence" gives a clearer delineation of that part of the mental growth age which the intelligence quotient implies, whereas the term "mental" is far broader in its interpretation, embodying a variety of psychobiologic factors that go to make up something that is called maturity. In connection with the "complaint problem" it should be stated that many of these children were first brought to the attention of the Henry Phipps Psychiatric Clinic in the course of a preliminary study of "intake material" which is made as a routine by the child-caring

*Data on Maladjusted Children with Declining Intelligence Quotients*

Patient No.; Name; Chron- ological Age	Date of Reference	Complaint Problem	Social Data	Somatic Facts
1 Woodward B. 7 yr. 11 mo.	3/14/27	Inattentiveness in school; truancy; tantrums; running away; repeats same delinquency again and again after punishment; sleep problem; confabulates about abuse of parents	Adequate financial situation; domestic security; family history insignificant	10% undernutrition; functional systolic heart murmur; mild astigmatism and convergent strabismus
10 yr.	4/6/29	Wandering away from home; carrying dirt and raw meat in pockets; sleeping in gutters; continually setting fires; cruelty to younger children	Removed from home and sent to Children's Village at Dobb's Ferry, N. Y.	
2 Marjory T. 9 yr. 7 mo.	10/24	Brought by child-placing agency for incorrigibility and trifling in school; babyishness; quarrelsome tendencies; poor social habits	Father died of tuberculosis; mother a practical nurse; orphanage for a year; boarded in supervisory capacity with children's agency; one brother stable; doing well in school	Poliomyelitis residual; several successful operations on lower extremities, resulting in reasonably good locomotion
20 yr.	2/21/36	Brought from Florence Crittenton Home for illegitimate pregnancy	Left school in 6th grade; drifted into sex delinquency	
3 Earl G. 6 yr.	6/30/22	Twitching and jerking; attacks of sore throat; fear of storms and rain	Mother dead; father boarded with child in homes of relatives and friends	Bed-wetting, hypertrophy of tonsils; auto-erotism
	1925	Boarding home complained of stubbornness; open auto-erotism; attempted sodomy		Tonsillectomy and adenoidectomy; correction of other physical defects
12 yr.	1928			
4 Edward R. 7 yr. 8 mo.	5/20/32	Poor school work; timid; no friends among age equals; private tutor failed to keep him up to private school requirements	Mother dead; father remarried; excellent living conditions	No defects, but small, undersized, asthenic
	1933	Same personality and temperamental picture		
11 yr. 8 mo.	5/26/36	Private school refuses to keep him longer; cannot be forced into 5th grade		Tall, thin, with strained expression; nails bitten; tremulousness
5 Harry M. 11 yr. 7 mo.	12/19/31	Mischievous; troublesome; tantrums in school; poor work; cannot dress self as well as younger brother; quarrelsome with equals	Good living home conditions but striving parents	Slightly undernourished; some speech defect with consonant, like baby talk
15 yr.	5/29/35	Returned by parents with story that he sits staring into space; has developed hallucinations; sits preoccupied even in front of food		Child walks with stiff gait; has various mannerisms of speaking and using his hands
6 Donald S. 7 yr. 2 mo.	4/22/32	Unintelligent stealing of watch and money from family; temperish; hard headed; bed-wetting; running away from home	Mother died in 1928; patient, 2 sisters and father living with maternal grandmother; father alcoholic, sporadically employed	Enlarged tonsils; functional systolic murmur; need of circumcision; moderate dental caries; poorly developed and undernourished; lisping speech
10 yr. 3 mo.	5/7/35	Still occasional bed-wetting; stealing and running away have disappeared; gets along better with other children		Physically satisfactory
7 Thelma S. 6 yr. 6 mo.	7/7/24	Auto-erotism; difficulty in grasping school work	Father deserted; mother works; patient and 2 siblings live with grandmother; overcrowded living conditions	Small stature; normal physical findings
16 yr. 8 mo.	6/5/34	Amenorrhea for past 3 mo.; marked sexual aggressiveness since menstruation at 12	Home situation somewhat improved from economic standpoint; less crowded	Small, undernourished; nails bitten; 3 mo. pregnant

*Data on Maladjusted Children with Declining Intelligence Quotients—Continued*

Intelligence Quotient and School Grading	Temperamental Characteristics	Subsequent Data
Repeating 1st grade; best subject reading Intelligence age 8 yr. 6 mo.	Finicky over foods; restless sleeper; wet and soiled self until 4 yr. old; stealing at 4 yr. to give money away; repeatedly set fires in basement; not trained to eat at table until 5 yr. old; alternate reactions of affectionate outbursts and belligerence and destructiveness	Somatic defects corrected; a year of parent and school education unsuccessful
Barely able to make grade 2 B Intelligence age 8 yr. 9 mo.	Appears remorseful after escapade but immediately enters into another	Removed from Children's Village for financial reasons; transferred to state correctional institution; still presents same behavior picture of psychopathic personality
Part 3d and part 3d grade in school for crippled children Intelligence age 9 yr. 8 mo.	Friendly, affectionate, popular; natural play reactions	Child continues in foster home, with several changes of boarding homes because of difficulty in social habits, associated with aggressiveness, tantrums and stubborn reactions
(1925) (1930)	.....	Difficulties of boarding home adjustment, with subsequent transfer to Episcopal institution for children, from which mother finally took child under her care
At 20 yr. of age Intelligence age 13 yr. 1 mo.	Childish in all reactions; emotionally unstable; management and disciplinary problem until commitment to state correctional institution for delinquent girls	Sterilized at delivery; unable to care for offspring; partial working home adjustment
1st grade, slow section Intelligence age 6 yr.	Babyish; poor concentration in school; stealing; sexually aggressive toward young children	Placed for two years in boarding home with child-placing agency
.....	Destructive; openly erotic; outbursts of silly laughter and anger in reaction to teasing from younger children; still in "Peter Rabbit" stage of interest and imagination; at times eats garbage out of cans; still wets and soils himself	No boarding home would keep the child longer; commitment to an institution for delinquents
Intelligence age 9 yr. 6 mo.	.....	Still in correctional institution, with problem of poor social habits and aggressive sexual behavior
Repeating 1st grade; school reports he tries hard but what is learned one day disappears the next Intelligence age 8 yr.	Conscientious; serious minded, worrying over failures; tense; unhappy	Removed from one private school and put into another with smaller classes; group given every individual tutoring attention and educational, social and athletic accessory that money can get
With educational and group intelligence test; struggling with 3d grade work	.....	Tutoring all summer and throughout school year; child becomes more tense and discouraged
Intelligence age 10 yr. 10 mo.	.....	School for retarded children recommended; parents place him once more with private tutors and more pushing
History of passing grades until 6th, then put back to 5th Intelligence age 11 yr. 7 mo.	Prefers to be alone; does not want to play; cries if corrected; appears sullen and temperish	Parents told child's school work should be lightened and more relaxation and time for play given; refused advice; insisted on pushing him and trying to discipline
(1925); sitting in chair in 9th grade Intelligence age 13 yr. 5 mo.	Obviously preoccupied; at times bursts into silly laughter; shows auditory hallucinations	Committed to state hospital
Repeating 2d grade Intelligence age 7 yr. 6 mo.	Timid; stand-offish; prefers younger children for play; denies stealing even when caught with stolen material	Patient and sisters committed to Children's Home
Grade 3 A Intelligence age 9 yr. 4 mo.	Much quieter but emotionally immature, as compared with other children of his age	School now aware of his retardation and has given up pushing him; child slated for special educational process as he gets beyond his intellectual depth in regular school work; in June 1936 barely passes grade 4 A with mark D
Slow grade 1 B Intelligence age 6 yr. 4 mo.	Appears duller than intelligence test rating; babyish in all play; openly auto-erotic; poor sense of danger; has to be helped in dressing	Mother told that child would undoubtedly be defective, advised to list her for state training school for defectives; mother considered child bright in spite of repeated failure to pass grade; at 14 yr. resented opportunity school placement, removed child from school
Intelligence age 7 yr. 8 mo.	Little emotional reaction to pregnancy, except childishly boastful of its making her important in family circle	Sterilized at delivery; unable to care for baby even with supervision of family; still at home

# *Data on Maladjusted Children with Declining Intelligence Quotients*

Patient No.; Name; Chron- ological Age	Date of Reference	Complaint Problem	Social Data	Somatic Facts
8 Betty S. 9 yr.	5/24/32	Examination prior to placement in child welfare organization; no behavior complaints	Mother dead; father and 2 siblings living with paternal grandmother; father alcoholic, irregular worker	Physical examination showed normal except for 12% under- nutrition
	1933	Brought for checking up by child-caring agency	Still in care of agency	.....
11 yr. 11 mo.	5/7/35	Failed grade 5 A in February; reported in school as inattentive, disorderly; ran away in February 1935	After running away from foster home, picked up by police and transferred to Children's Home	Physical condition satisfactory nails bitten
9 Martha L. 4 yr. 10 mo.	7/12/32	Brought for examination prior to placement in child welfare institution; no complaints of behavior or adjustment	Illegitimate child deserted by mother; father unknown; desul- tory bringing up prior to commitment	Small, undernourished and undersized
	6/8/34	Returned for psychiatric check- up; no complaint from home or school	.....	Up to ideal weight
8 yr. 7 mo.	4/17/36	Returned for check-up	.....	.....
10 Dorcas A. 9 yr.	5/9/31	Examination with reference to placement in foster home; no behavior problem except tan- trums	Mother died when child was infant; child placed with rela- tives and later in institution; excellent conditions in foster home	Nails bitten; just recovering from tonsillectomy and adenoidectomy
	2/24/33	Screams and cries when she can- not have her way, then apologizes	.....	.....
14 yr. 2 mo.	7/10/36	Brought in for recheck in regard to home work and school behavior	.....	.....
11 Isabel F. 5 yr. 4 mo.	10/28/25	Examination prior to place- ment in children's institution	Father died; mother factory worker	Physical condition excellent
	3/28/29	Brought in for recheck; school reports slow progress; mastur- bation and temper tantrums developed	Child still in children's institu- tion	Needs tonsillectomy and adenoidectomy
	1934	Not applying herself in school; prefers to hang around kitchen and cook; likes to wait on table to do things with her hands	.....	.....
14 yr. 10 mo.	1935	Brought for recheck; since trans- fer to vocational school child much better in all reactions; happier	.....	.....
12 Claudia M. 4 yr. 11 mo.	11/14/27	Referred by child-placing agency for examination prior to place- ment; no complaint except inat- tentiveness, babyishness, enuresis	Neglected, dependent home in infancy; acquirement of gonor- rheal vaginitis in 1925; placed in contagious hospital until cured and later sent to orphanage, from whence committed to agency; mother chronic alcoholic, promis- cuous mental age 7½; father alcoholic	Enuresis; impetigo; carious teeth; 10% underweight
	1930	.....	Continues in boarding home	Tonsils removed; enuresis prac- tically disappeared; up to ideal weight
	1932	No complaints in adjustment	In same boarding home	Health satisfactory
	1934	No complaint except boarding mother is worried over slowness in school work and resents teacher's promotion of child in 1933 on probation	.....	.....
13 yr. 7 mo.	1936	Boarding mother complains of continued restlessness with night- mares, nail-biting, tearfulness; school complains child could do better if she tried	.....	Child strained and tense; hands cold and clammy; nails bitten badly



*Data on Maladjusted Children with Declining Intelligence Quotients—Continued*

Intelligence Quotient and School Grading	Temperamental Characteristics	Subsequent Data
3d grade Intelligence age 10 yr. 4 mo.		
School reports backward in arithmetic; inattentive	School and home report impudence; restlessness; clowning; teasing and spurts of activity, followed by slumps with tears and tantrums	
Falling in grade 5 A Intelligence age 10 yr. 8 mo.	Full of thin excuses for running away; attention span obviously poor both in conversation and tests	School advised to transfer her to special class, where she can get satisfaction in school work
Intelligence age 5 yr. 6 mo.	Quiet, alert little girl, outgoing in reactions; makes excellent impression	
1st grade		
Grade 3 A with average of 85 Intelligence age 8 yr. 4 mo.	Well liked in institution and school; likes to take responsibility; pleasant; attractive and popular	
Grade 3 A; reported slow in all work; teachers feel she could do better if she tried Intelligence age 9 yr. 5 mo.	Tantrums over home work and when teased by children her own age	Foster parents and agency warned that child would probably be dull-normal and they should ease up on perfectionistic requirements and restandardize each year
Barely passing grade 5 A falling in arithmetic		School warned that child should be steered toward vocational school instead of high school during junior high school period
With help of summer school and tutoring child gets through grade 8 A; promoted to grade 9 B with 4 conditions Intelligence age 12 yr. 10 mo.	Reported as loud, impudent, easily led, disagreeable	With great difficulty school and home consent to steer child toward vocational school; hard to realize her deficiencies are not due to lack of effort
Intelligence age 5 yr. 8 mo.	Seems pleasant and agreeable; no behavior problem reported	
3d grade	Reported as "hard headed" and prone to tantrums; feelings easily hurt	
Grade 8 A; poor, barely passing; teacher reports she could do work if she applied herself		Tonsillectomy and adenoidectomy in 1930
Child taking course in vocational school and showing initiative in application to living conditions Intelligence age 14 yr.	Is much better liked by the other children; appears less strained	Hard to convince teachers and institutional heads that easing up on child's school situation and changing to school objectives in keeping with her interests and capacities would be most helpful
Intelligence age 5 yr. 8 mo.		
Promoted to grade 2 B but reported slow in grasping school work, especially arithmetic		
3d grade		
Did not pass grade 4 B	Tantrums and nail-biting	Clinic advised child's repeating grade 4 B; school insisted on promoting to 5 B on trial
Repeating 7th grade Intelligence age 11 yr. 11 mo.		Boarding mother advised to give up planning for high school and to make vocational school plans

# *Data on Maladjusted Children with Declining Intelligence Quotients*

Patient No.; Name; Chron- ological Age	Date of Reference	Complaint Problem	Social Data	Somatic Facts
13 Catherine P. 6 yr. 6 mo.	11/16/29	Slow in school; disciplinary problem at home; spat on callers from stairway; kicked and pinched other children; not pop- ular with children of own age	Excellent family circumstances; father and mother intelligent but high strung	Operated on for congenital foot as an infant; wears shoes; late in walking
	11/24/33	Reported below grade and failing in 4th grade; uneven perform- ance; concentration poor but effort excellent	.....	.....
14 Laverne K. 3 yr. 9 mo. 6 yr.	3/18/29	Examination with reference to placement in children's insti- tution	Parents deserted, leaving 4 chil- dren; brought up by aunt	Slight right inguinal hernia; 3 lb. underweight
	6/12/31	Brought for recheck; no behavior problem; just starting to school	.....	Above ideal weight
	3/24/33	.....	.....	Tonsils enlarged, with palpa- ble cervical glands
10 yr. 8 mo.	11/36	Returned for recheck; no behavior problem	.....	Tonsils removed
15 Charles B. 8 yr. 2 mo. 10 yr. 4 mo.	9/14/34	Examination with reference to placement of semidependent child; no behavior problem elicited	Parents divorced; father non- supporting; mother works out	In good physical condition
	11/11/36	Within the past year has been doing poor school work; is unpop- ular with teachers and children; is a telltale; confabulates where inadequacies are concerned; makes a great deal out of slight illnesses; called a sissy by play- mates because of babyishness	Has been at children's home, maintaining good degree of health; mother visits once a week; has been no problem in child-parent relationships	Somewhat fat but not over- weight for height and age
16 Nelle D. 9 yr. 8 mo.	9/17/30	Examination prior to placement out of undesirable home; no behavior problem	Father died; mother working out, unable to provide home for child	Patient had infantile paraly- sis in infancy, leaving her with slight speech defect; good physical condition
15 yr. 11 mo.	11/11/36	Brought in for reexamination because of deficiency in school work, with resulting loss of interest and tearfulness	Likes the boarding home in which she has been since 1934; gets \$2 a week for her work; goes to school; is one of the family	Good physical condition
17 Virginia C. 5 yr.	6/18/21	Examination with reference to placement because of dependence and neglect; temper tantrums with bumping head against wall; tears things to pieces; bites and slaps; occasional bed-wetting	Parents divorced	Physical condition normal
	10/15/23	Child returned because of same behavior problem; unresponsive to training of boarding homes; continually into everything; at odds with environment	Child has been in 11 boarding homes in 2 yr. which have refused to keep her because of aggressive activity, tantrums, lying and destructiveness	.....
12 yr. 6 mo.	5/18/27	Continued to be disrupting influence in institution during the last 3 yr.; wets and soils herself when corrected; at times docile and sweet tempered but subtly undermines the morale of the institution	.....	Physical condition satisfactory
14 yr. 6 mo.	1930	Recently expelled from public school for "dishonesty and impudence and attitude unfit to be with other children"	Boarding mother has done bet- ter with her than any one else but is worn out and discouraged by failure to make any appeal or to help her learn from her own mistakes	.....
17 yr.	1/6/32	Returned from correctional insti- tution with recommendation that she be committed to Maryland State Institution for Delinquent Girls	.....	.....

*Data on Maladjusted Children with Declining Intelligence Quotients—Continued*

Intelligence Quotient and School Grading	Temperamental Characteristics	Subsequent Data
1st grade private school; slow in all work, falling behind other children; intelligence age 7 yr.	Tires of play and work easily; jumps from one excitement to another; child says: "I am so good in school I want to be a devil at home"	Parents told that although the intelligence quotient was good at present general reactions and developmental history would make one keep in mind the probability of a declining intelligence quotient
Falling 4th grade; school reported: "Catherine will continue to present increasing difficulties to her teachers as subject matter becomes more complex"	Babyish in interests; even parents notice difference from children of her own age	Parents told of child's definite intellectual retardation and advised to place her in another school environment; instead of selecting one suited to the child's limitations they placed her in another accelerate school to give her "one more chance"
Too uncommunicative to respond to intelligence test	Timid, shy little creature	General reactions in playroom showed nothing that would indicate intellectual retardation; advised placement in institution with follow-up
With base line of 4 and scattering through 5, 6 and 7; intelligence age 6 yr. 2 mo.		
Repeating 1st grade		
In grade 3 A; intelligence age 8 yr. 10 mo.	A quiet child, who does everything she is told but shows little initiative in play or association with others	Child at 10 yr. 8 m. is in grade 3 A, with an average of 80. Her pleasant disposition and temperament and smallness of stature give her the appearance of a child of about 8; her teachers still feel she is intellectually normal and fail to see any serious discrepancy between her school grading and her chronological age
5d grade rural school; intelligence age 9 yr. 10 mo.	Outgoing, with normal play reactions; no complaint made by school or mother	It was recommended that the child be put in a children's institution
Grade 5 A; gets "poor" and "fair" in tool subjects; intelligence age 11 yr. 1 mo.	Petulant, whining and unhappy; constantly running with his complaints and tattling; disliked by other boys; poor coordination in athletics	Child evidently is doing the best he can in school but cannot grasp fundamentals of work, especially arithmetic; cannot hold his own in play; prefers younger children and girls as playmates; school feels he could do better if he tried; mother has remarried; advise returning him to her, with the hope that the security of his own home may give him better emotional adjustment
Grade 3 A; no complaints in school except poor in arithmetic; intelligence age 9 yr. 2 mo.	Described as docile; child appears pleasant and agreeable; outgoing in reaction so far as play and relationship to others are concerned	Placed in children's institution, where she got on well and progressed naturally in school; no behavior problem; September 1934 placed in boarding home, continuing in same school
8th grade with deficiencies; intelligence age 12 yr. 10 mo.	Is discouraged over school marks and is evidently doing the best she can; takes it out in temper tantrums and tearfulness	Advise to continue in living arrangements and transfer to vocational school to which child is ambitious to go; does excellent work with her hands and is interested in what she does more than in what she gets out of books
Intelligence age 5 yr. 4 mo.	Child bright and alert but restless, with poor attention span; talkative; occasionally auto-erotic; committed to child-placing agency and placed in foster home	
Grade 3 B	Child continues restless and fidgety; constantly talking; fights with children in playroom	By reason of difficulty with different boarding homes, it was thought best to place her in a children's home where she could be under constant supervisory training and have less opportunity for her individuality to run wild
Grade 6; excellent report in school work; gets subjects easily; intelligence age 11 yr. 5 mo.	Child continues violent tempered; destroys toys and clothing of other children; strikes at children; auto-eroticism without attempt at concealing it; unintelligent lying even when caught in misbehavior	Patient was placed in country in boarding home with particularly intelligent family
Falling all subjects in rural high school (1930); intelligence age 12 yr. 6 mo.	Casual toward failures; no special interest; usually unreasonable in any discussion of difficulties	No other alternative but to send patient to correctional institution in northern New York for a prolonged period of training
Intelligence age 12 yr. 6 mo.	Aggressive, arguing, stealing; open sex overtures to her environment	After 11 years of consistent effort on the part of environment to help this girl adjust herself to life we were faced with necessity of commitment to state institution for delinquent girls until of age; child's intelligence age of 12½ years is same as that of 1930

# *Data on Maladjusted Children with Declining Intelligence Quotients*

Patient No.; Name; Chron- ological Age	Date of Reference	Complaint Problem	Social Data	Somatic Facts
18 Mary L. 7 yr. 6 mo.	2/18/29	Brought for examination with reference to placement of depen- dent child; no behavior problem	Mother died in child's infancy; father along in years and dependent; child raised by relatives	Excellent physical condition
	2/6/32	Brought for recheck; no com- plaint	.....	.....
	12/13/34	Brought for recheck	.....	.....
15 yr. 3 mo.	7/10/36	Shirks work; cries over lessons; lies about inadequacies; is irri- table, unhappy and discontented	.....	.....
19 Mary W. 11 yr. 4 mo.	1/6/31	Easy tearfulness; suspicious; suicidal attempt associated with sudden death of father	Father drowned June 1930; mother promiscuous, irrespon- sible person, seeking to pass her children on others	Twenty pounds underweight; mediastinal tuberculosis; tonsil- lectomy and adenoidectomy; occasional bed-wetting
16 yr. 10 mo.	4/1/36	Child brought back for recheck; has been happy and well adjusted voluntarily asked for vocational school transfer; no behavior problem	.....	Pulmonary pneumonia 1933; appendectomy November 1935
20 Melba B. 5 yr. 6 mo.	7/25/30	Stubborn; wets herself at play; talks baby talk	Oldest of 2 children; did not walk until 17 mo.; good home background; easy-going parents; financially secure	Physical condition excellent
	3/15/31	Two parents worried over child's poor school work; in 1st grade February 1931	.....	.....
	12/21/34	Recheck of continuing poor school work	.....	.....
11 yr. 2 mo.	2/21/36	Does not study at home; will not do her home work; hates school; has no playmates of own age	.....	Normal physical development for a child of her age

agencies and institutions in which they were received. Not only are the wards of these agencies given a thorough health examination prior to admission, but they are brought back at least once in two years, and in some instances annually, for a recheck of their growth and development.

In making psychometric tests of these and all other children examined in the Henry Phipps Psychiatric Clinic, the Stanford revision of the Binet-Simon tests, as copyrighted by Lewis Terman in 1920, was used. In every instance the tests were given either by me or by a senior member of the staff who had had seasoned experience. Every psychometric test given by a staff member was reviewed by me, with a personal examination of the child, in association with study of written reports from the agency or the institution, histories obtained from the parents or the foster parents and data obtained directly from the schools. At the conclusion of each examination and conference with the agency, the institutional social workers or the parents, a letter was sent by the chief of the dispensary summarizing the facts obtained and giving concrete suggestions as to further recommendations. Letters concerning school problems were sent to the principal of the child's school and to the family physician, if the case was a private one. Carbon copies of all letters were filed with the child's history, so that records were kept up to date with each subsequent visit. The psychiatric

# *Data on Maladjusted Children with Declining Intelligence Quotients—Continued*

Facts and conditions	Intelligence Quotient and School Grading	Temperamental Characteristics	Subsequent Data
	Beginning 2d grade intelligence age 8 yr.	Plays agreeably; no behavior difficulties except auto-erotism; outgoing; liked by other children	Child was placed in a children's home and continued in school without difficulties but was slow in her work; remained in good health and was well liked by others
	Grade 4 A	Active, energetic, full of mischief; curious about getting into troubles of others	
	Grade 6 A; beginning to get poor marks, barely passing in every subject	Tearful over failures; bites nails and is quarrelsome with children; poorly adjusted	It was felt that this child should not continue further in high school but should be switched to prevocational school; school opposed this, saying she could do work if she tried; efforts made to help her with home work and ease up on school problems
	Promoted to grade 8 on trial intelligence age 12 yr. 8 mo.	Bitterly resents failures; tries to appear superior and nonchalant over inadequacies	School system is now ready to transfer her to vocational school, but child has built up such a feeling of disgrace associated with it that she says she will leave school rather than go
Overweight; stasis; tonsillectomy; adenoidectomy	Grade 5 A; no report from school available intelligence age 11 yr. 7 mo.	Nervous, tearful child; frequent night terrors, afraid of dark; obviously insecure	Child placed in convalescent home after tonsillectomy and adenoidectomy for remaining 9 months until up to ideal weight, subsequent to transfer to children's home 9/5/31
Child 1933; summer 1934	Promoted each term but with grades noticeably lower, until finished grade 8 A, February 1934; transferred to vocational school, taking tea-room course intelligence age 13 yr.	.....	At this time child transferred to free home with continuance of vocational schooling and \$1.50 weekly wage; delighted with change in arrangement; at present in line for excellent position on graduation from vocational school course
Excellent	Grade 4 intelligence age 5 yr. 10 mo.	Fussy over food; clings to mother; babyish in all ways; prefers younger children as playmates	It was felt that this child's general reactions were those of immaturity more deep seated than could be attributed to poor training; education advice given parents
	Lowest mark in a class of 3; teacher says patient site and smiles, has a short attention span, does not seem to catch on	.....	Parents warned to be patient with the child and not to force her to the precociousness which they expect; prepared for probable declining intelligence quotient
	Failed grade 4 B	Temper tantrums; still finicky about food; babyishness even more marked	
Development	Repeated grade 4 A; now in grade 5 B; school reports child very slow and inattentive intelligence age 9 yr. 3 mo. (2/31/36)	.....	Characteristics with relation to food and association with others and play give evidence of a serious constitutional defect

social worker on children's cases at the clinic acts in a liaison capacity between the clinic and the school, home, family physician and agency or institution. In these and other ways every reasonable effort is exerted to make sure that therapeutic suggestions are understood by all to whom they are made.

## COMMENT

In the cases presented for consideration in this paper, attention is drawn to the early reactions of each child, together with his general psychobiologic development as far as it was possible to obtain such a history. Records of children brought as "neglect and dependence problems" for placement in institutions and child-caring agencies are necessarily scant; it is only after a period of observation that characteristic behavior is discovered. Frequent examinations are imperative. Agencies and institutions can err as much in taking for granted that all untoward idiosyncrasies are due to previous poor environment as in taking for granted that such behavior is due to poor stock and cannot



be modified. Frequent and careful evaluations of the child's actual behavior are the only safe guides for planning and prophecy.

It is generally conceded by psychologists that decline of the intelligence quotient from normal or above normal is present only in cases in which a psychotic condition exists on an organic or functional basis, or, as Terman put it,<sup>6</sup> "barring definite nervous disease." In this series it may be stated with a reasonable degree of certainty that patients 1, 3 and 17 belonged in a group of psychopathologic persons known as psychopathic personalities, or constitutional psychopaths. The psychopath is a person who is born constitutionally unable to manage his instincts and emotions, regardless of the degree of his intellectual equipment. He may be of average intelligence or retarded, and not infrequently he is precocious. His outstanding characteristic is his lifelong inability to acquire a degree of maturity that enables him to take his place in society without constantly running amuck. Intellectually he knows the consequences of his acts, but constitutionally he is wholly incapable of acting on this knowledge in using any degree of insight or habit training to which he has been helped. In the final analysis he is unmodifiable human material. In childhood it is impossible to differentiate between modifiable and immutable material without years of exposure to training. In cases 1, 3 and 17 one sees children who from the earliest records obtainable have expressed a combination of abundant energy and motivation that has always been purposeless so far as giving them any satisfaction that is understandable either to the rank and file of children or to adults. Their intellectual equipment played little rôle in their behavior. If one compares their behavior with that of children, adolescents and adults of similar intelligence ages ( $8\frac{1}{2}$ ,  $9\frac{1}{2}$ ,  $12\frac{1}{2}$  years), one will see at once that the inhibiting influence of such degrees of intelligence commonly produces social patterns that are reasonably adjusted to group living. One can housebreak dogs and cats; i. e., one can teach them by patient and consistent habit training, through the trial and error method of experience, to acquire a working concept of the consequences of their actions. But here are human beings who, after years of effort in a variety of training environments, cannot be taught to realize the invariable consequences of their acts. Their behavior does not make sense. They follow any instinct or impulse that flits across the surface of their minds, regardless of what discomfort of pain or self-isolation is a consequence. Habit training of any degree or description is unable to get a toe-hold in their functioning. They represent immutable human material and constitute a continuous menace to society unless they are kept in an environment which forcibly restrains them from following their impulses.

Case 5 represents another psychopathologic condition in which the decline of the intelligence quotient is to be interpreted in association with a personality change which belongs in the schizophrenic (parergastic) reaction group.

A Jewish boy did excellent work in the early grades and had an intelligence quotient of 115, according to group intelligence tests for the third grade given by his school. In personality, however, he was always timid, shy and standoffish, more comfortable in mingling with younger children and imaginative to the point of being bizarre. As he continued in school life and was confronted with the necessity for progressive adaptations to the world of reality associated with work and play, he seemed to find the process increasingly painful and retreated into day-dream and fantasy as a refuge. His school work slackened, and pressure by the home and school was exerted, with a reaction on the child's part of tantrums and petulance. Advice to ease up on pressure was ignored by the school and the home. The school demoted him as a disciplinary measure. The home deprived him of privileges as punishment. In four years there was a complete retreat into preoccupation, with hallucinations, stereotypy, mannerisms and a habit deterioration sufficiently complete to require state hospitalization.

The condition in case 5 is typical of what happens to hundreds of children in the stress and strain of ordinary living.

Leaving these four cases in which psychology recognizes the decline of the intelligence quotient as incident to psychopathologic conditions, I turn to a discussion of the other sixteen boys and girls reported on in the table.

Patients 7 and 20 displayed a serious drop in the intelligence quotient—patient 7 from 97 to 46 during ten years and patient 20, from 114 to 83 during six years. In patient 7 an intelligence age of 6 years and 4 months at a chronological age of 6 years and 6 months developed in ten years only to an intelligence age of 7 years and 8 months. In patient 20 an intelligence age of 5 years and 10 months at a chronological age of 5 years and 6 months developed in six years only to an intelligence age of 9 years and 3 months. Both these children early showed unmistakable evidence of serious immaturity in their psychobiologic make-up, as evidenced by backwardness in early development, prolonged babyishness in speech and food habits, maternal dependence and inferior play reactions, which not only preceded but later accompanied a poor grasp of school work. Patient 7 showed a constitutionally inferior physical set-up; patient 20 did not. In both the general reactions gave evidence at an early age of a degree of immaturity below the intellectual maturity as indicated by formal psychometric tests. Patient 7 grew up under poor social and economic conditions; patient 20, under good standards of living. Yet the fundamental psychobiologic reactions of both, over a period of years, developed approximately similar deficits, which must be classified as feeble-minded.

Patient 15, a lad brought for examination prior to placement by reason of a broken home, showed a drop of 23 points in the intelligence quotient during twenty-six months. No complaint of maladjustment was made at the time of examination. After placement in a children's home and transfer from a rural to a city school, it soon became evident that the child was far from well adjusted, for reasons outlined in the chart. He could not progress in school work, in

spite of special helps in arithmetic given by his teacher outside school hours. He was unpopular with other children at school and in the institution, in spite of every effort by social workers at the institution, playground workers and the cottage "mother." He has aggressively persisted in irritating and antagonizing his fellows by fussing over food, petty illnesses and accidents in play, continuous tattling, poor sportsmanship in games, whining and sulking. It is suspected that Charles has always shown these traits and that they have come to the foreground in the last two years partly because he has been under closer observation and partly because group living has emphasized his contrast to other children. One cannot escape the fact that boarding homes are much less likely to give true pictures of foster child behavior, until that behavior becomes unendurable, because of the remuneration which is attached to the child. A well run, adequately staffed institution not only picks up but reports child maladjustments earlier and more promptly. Charles' mother has remarried, and he is being returned to her home, where he will be followed, with the hope that its emotional security may be more helpful to him than institutional life has proved. His intelligence quotient at 15 years is problematic, but one believes that intellectually he is likely to stop growth at the 12 or 13 year level.

The remaining thirteen children—patients 2, 4, 6, 8, 9, 10, 11, 12, 13, 14, 16, 18 and 19—presented a somewhat different group of problems associated with declining intelligence quotients and maladjustments. These constitute what may be termed the rank and file of such children. Intellectually they were retarded and ranged from the middle of what psychologists classify as "upper grade morons" to "borderline" and "subnormal" children. There is rarely anything in the early developmental story of these children that flags the attention, although, as in case 13, one sometimes obtains a report of oddities that were interpreted as "cuteness" at the time but that in the retrospect of subsequent years take on a serious significance. There is frequently a story of timidity and shrinking and prolonged babyishness in the form of speech or maternal dependence or slowness in getting started in new things. When the child enters the school period, teachers may complain of "flightiness" and a short attention span, but teachers, as well as parents, are often certain that the child will outgrow his immaturity. Formal psychometric tests, individual or group or educational, rate the child's intelligence quotient at from 110 to 90, which falls well within the range of what psychologists classify as "normal" or "average," with the result that no further thought is given to the possibility of the child's intelligence growth slowing or stopping. It is taken for granted that his mental growth curve will continue to keep pace with school requirements. When he begins to slow down in his school work, it is assumed that "he could do it if he only tried," and consequent pressure is applied in the form of tutoring, summer school for subjects in which he fails, promotion on trial and deprivation of play and recreations. If the child is getting beyond his intellectual depth, he reacts to these

tactics in a variety of ways, dependent on his temperament. Some children become "hard headed," truant, aggressively delinquent and impudent; others become tense and strained, and nail-biting, night terrors, tantrums and explosiveness, easy tearfulness and a wealth of reactions medically characterized as "nerves" develop; still others relapse into uncommunicativeness, with sullen spells and balking.

Treatment of the delinquency or "nerves" should never be undertaken until time has been spent in a thorough diagnostic study. In making such a study it is important that the psychiatrist, the psychologist, the pediatrician and the social worker should give equal scrutiny to all aspects of a given subject. For example, the pediatrician has a tendency hastily to turn over such problems to the workers in the behavioristic sciences, after he has ruled out somatic "pathologic" conditions; yet it is to the school physician that the child in poor health comes first. The psychiatrist is likely to leave the intellectual and educational aspects of any given child maladjustment to the psychologist, and both, in their eagerness not to miss situational and personality "complexes," can fail fully to recognize and evaluate psychobiologic endowment. Scientific tests for capacities may reveal conclusive data on first examination. Again, they may not present any factual evidence that is diagnostic. A psychometric test is no exception to this statement. Certainly, no psychometric test should be evaluated except in association with a careful scrutiny of the child's general reactions that take part in what is spoken of as maturity. Years of work and association with the maladjustments of children have convinced me that the intelligence age of a child under 10 years, unless it is very low or very high, cannot be taken as at all prophetic of his intellectual growth curve. Certainly an intelligence quotient of from 90 to 110 in a child under 10 years of age classified psychologically as normal is by no means an indication that such a child is high school material.

Patients 11, 12 and 14, who were seen first at the age of 5 years or under, with no behavior problem, showed a fairly common course both as to adaptive difficulties and the environmental perplexities around them. Had the initial intelligence quotients of these children, ranging from 102 to 110, been taken as prophetic, planning for them now would be much more complicated. It has been only in following them for from seven to ten years that my associates and I have become aware of their limited capacities. The time wasted by public and private school systems in pushing and prodding this intellectually limited material to keep up to regular grade work is noteworthy. One cannot blame parental resistance to vocational schools, when formal education builds up resistances against vocational schools and trade schools as educational processes that are a sort of last resort. One would not insist on keeping

tight shoes on a child's feet. Equal painfulness results from insistence on keeping boys and girls in grades that are shown by the pupils' actual performance to be far beyond their intellectual depth.

Patient 18 was a girl who in February 1929, at the age of  $7\frac{1}{2}$  years, was healthy and outgoing, with an intelligence quotient of 105 and an intelligence age of 8 years. In December 1934—five years later—she became a school and environmental problem; she received poor marks in the eighth grade, was tearful over failures, quarreled with other children and acquired nail biting. Her intelligence quotient was 96. In July 1936, at the age of 15 years, with an intelligence age of 12 years and 8 months (intelligence quotient, 72), she was promoted on trial to grade 8 A. Her behavior problem had increased. She shirked work, cried over her lessons and lied about her inadequacies. Now, within less than a year of the legal age for school requirement, her teachers at last consent to transfer her to vocational school. (There is a ruling in the public school system that a child who fails of promotion is not entitled to further public school instruction after 16 years of age.)

Of what use are social studies and courses in mental hygiene in school curriculums when the school system itself, by its own rigidities, turns out a young citizen with a bitter and unwholesome attitude toward life? In 1934 the school was urged to transfer this child to vocational school, but it was thought that she was intellectually able to do junior high school work because she had an intelligence quotient of 96, which, according to psychologic classification, falls within the range of "normal" or "average" mentality.

The histories of patients 4 and 6 illustrate the failure to recognize the relationship between the latent development of school and home maladjustment and a declining intelligence quotient.

Patients 4 and 6 were two boys who had shown signs of strain from their earliest school years. They expressed their personal uncomfortableness in different ways, by reason of their temperaments. Patient 4 was a shy, timid, docile, quiet child, always putting forth every effort to do his best to keep up to what was educationally expected of him. Patient 6 came from less stable stock and expressed his uncomfortableness in stealing, running away and enuresis. His stealing is described in the table as "unintelligent." For example, he took the teacher's watch from her desk with other children watching him and carried it around all day, displaying it in the yard with great pride as a pretty piece of jewelry. When the news reached the teacher's ears and she asked him about it, he denied he had it, and even when it was found in his pocket he declared with tears that he did not know it was there. Again, he took \$2 from his mother's purse, told his siblings about it and when questioned by his parents, who found the bills in his pocket, wept and said he did not know how they got there. Obviously, this is a quality of stealing that one does not see in a child with an intelligence quotient of 105. It is the fumbling attempt at getting some coveted object that one finds in a child of 4 years. Both the children are biologically undersized and babyish in their emotional reactions. They do not measure up in general maturity to boys and girls of their chronological ages. From their general behavior and development, one should suspect early that they are con-



stitutionally far more immature than their intelligence quotients indicate. Yet it took three years in one case and four in another for the intelligence quotient to drop from 105 to 91 and from 104 to 84, respectively. The slowing up of the intelligence age was even more striking.

Patient 19 was a girl of poor stock who was brought because she presented a serious problem of moody spells, suspicion, antagonism and uncommunicativeness, with a suicidal attempt following the sudden death of her father. She had a tremendous sense of family relationship and of wanting to be owned. She grieved over the casualness of her irresponsible mother. Her physical condition was poor. In five years she became as well adjusted a girl of 16 as one would wish to see. In spite of two serious illnesses and the continued casualness of her mother, Mary has found herself by reason of satisfaction and contentment in the thing she is doing. She presented a problem at the convalescent home, where she gained the 20 pounds (9.1 Kg.) to reach her ideal weight. The transfer from this home to the children's home was another trying period. Then came transfer to a home where she goes to school and acts as mother's helper. The school and the home give glowing reports of her, and Mary's account of her ambitions and plans is even more satisfactory.

#### CONCLUSION

It is reasonable to assume that the guidance of childhood and adolescence by the school and home and through social case work and formal mental hygiene could be materially aided by a more careful study of individual child capacities, that as important a feature as intellectual capacity cannot be summarily dismissed by one or two psychometric tests but must be closely rechecked, especially when signs of maladjustment appear in the child's behavior, and that no psychometric test can be adequately evaluated except in association with a careful scrutiny of the individual child's psychobiologic reactions as a whole.

There is too much pressure by supervisors of public and private educational systems to keep children in regular grades, with the result that the elementary room teacher is made to feel that failure to promote students is a reflection on her teaching. Junior high school should be a period of careful accounting of stock, with the goal of planning and recommending what is best for individual children rather than what looks best on an annual report or what parents demand. Until public and private school systems take a firm stand on such matters and refuse to yield to parental importunities of ignorance or false pride, children and adolescents will be sacrificed by embarking on plans for life wholly unsuited to their capacities. Educational systems must whole-heartedly and not apologetically subscribe to special educational processes of prevocational, vocational and trade schools, which are just as conducive to habit training for living as the so-called higher educational processes. Parents and social workers will not accept such procedures unless formal education leads the way. Educational psychology needs to clarify to teachers and clinicians actual data concerning the relationship between

the psychologic classifications of the intelligence quotient and the ability of the individual child or adolescent to cope with any given grade work. It is not enough to say that theoretically any child ought to be able to do sixth grade work at the age of 12 years because at the age of 8 years he had an intelligence quotient of 110. The real point is that he may be failing and that the school should pause and find why. "Let us encourage teachers to teach pupils to do what they can do, both in work and in recreation, and rest, instead of making them the half-obedient servants of a system often killing the native interests and inculcating habits of serving time, rather than doing their work efficiently."<sup>11</sup>

Miss Elizabeth B. Cross, Children's Worker in the Social Service Department of the Henry Phipps Psychiatric Clinic, and my secretary, Mrs. Alice B. Meyers, helped in the organizing and assembling of this material.

## THE PATHOGENESIS OF HALLUCINATIONS AND DELUSIONS

REMARKS ON THE DISTINCTION BETWEEN PATHOGENESIS  
AND ETIOLOGY IN PSYCHIATRY

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The distinction between pathogenesis and etiology deserves more attention than it usually receives. Though its value in neurology has been recognized, it is almost completely ignored in discussions of the causes of symptoms of mental disease.

The distinction may be illustrated by an example, hemiplegia. In explaining the occurrence of hemiplegia one may say two things: (1) The pyramidal tract has been interrupted, and (2) there is (I shall suppose) a large cerebral hemorrhage. The first statement refers to the structures which must be damaged before there can be hemiplegia; it is a statement of pathogenesis. The second refers to the agent which has produced this damage; it is a statement of etiology. No neurologist in explaining a case of motor loss would be satisfied with a statement concerned exclusively with etiology; he would regard it as one sided. But this one-sidedness is found in most discussions of the causes of mental disease, as may be illustrated by reference to dementia paralytica.

It is commonly asserted that the problem of the cause of dementia paralytica has virtually been solved, since it is known to occur only in persons with syphilis and since much is known about the accompanying inflammatory changes in the brain. However, does this entitle one to believe that the causes of dementia paralytica are understood? I submit that its etiology alone is understood. Its pathogenesis is illuminated not even in the slightest degree by the data mentioned. The chief symptom of dementia paralytica is a disturbance in conduct and in thinking (memory, judgment, reasoning power, etc.)—in brief, a disturbance of the mind. In order to understand the pathogenesis of this symptom, one must first understand the nature of the physical substrate of the mind—"the highest cerebral centers," as Hughlings Jackson called them. One must know how these centers are constituted and how they operate. One must determine what degree and what type of damage they must undergo in order that certain mental disturbances may be produced.

The problem here may be compared with that presented by alcoholic epilepsy. Assume a clear case of alcoholic epilepsy, a case in which the patient has epileptic fits when drunk and is free from symptoms when

sober. The problem seems simple: Stop drinking and the fits cease; resume it and they return. But really it is not so simple. In every instance of epilepsy there is a discharging lesion, and one must therefore ask: "Where is the discharging lesion which in this particular case is set off by alcohol?" To answer this question one must, among other things, study carefully the details of the fit, noting particularly the nature of the aura, the parts of the body first convulsed and the march of the spasm. When one has located the discharging lesion and has explained how its discharge produces a particular kind of fit, one has clarified the pathogenesis of the condition. When one has shown only that the fits are precipitated by the excessive use of alcohol, one has clarified only its etiology. Discovery of the etiology is not enough in the scientific study of an instance of epilepsy; even when the etiology is known, one must study the fits just as painstakingly as when one does not know it.

After these preliminary remarks, I propose to consider the pathogenesis of hallucinations and delusions. These symptoms are chosen because their pathogenesis is clearer than that of most other symptoms of mental disease.

In explaining the causes of a hallucination, some physicians think it enough to uncover the complexes and life experiences to which it seems to be related. Thus, to take a common example, a schizophrenic spinster hears voices branding her a prostitute. Investigation shows that she has never made a satisfactory sex adjustment, has had no opportunity to marry and has suffered from sex tension. It is said that these data explain the hallucination, which arose to fulfil a wish for sex gratification. But this explanation, I submit, is fallacious. The data in question explain only why the patient thinks about sex; they do not explain why this thinking is carried on in hallucinatory images. Many women suffer from unsatisfied sex longings, but only a few have hallucinations; the others merely think about sex—they have fancies about it. Therefore, the real question is: "Assuming that the circumstances of a woman's life make her think much about sex, what will cause these thoughts to occur in the form of hallucinations?"

Some light is thrown on this problem by Hughlings Jackson's views on the nature of the cerebral processes concomitant with imagery. Jackson used the terms "vivid image" (e. g., when one sees an object) and "faint image" (when one merely thinks of, or visualizes, that object). This distinction between vivid and faint images is, in more familiar terminology, the distinction between perception and representation.

When one sees an object, the physical process, according to Jackson,<sup>1</sup> is as follows:

I suppose that I am seeing a brick. . . . What first happens is that there is a peripheral impression (upon the retina), impulses then pass through the lowest, through the middle, and up to the highest sensory centres. . . . So far we have only stated one half of the reflex action, have only reached the physical condition in the highest sensory centres correlative with the colour of the brick. It and all other objects have shape, and this as much requires to be accounted for as the colour. The shape of an object is the relation of its several positions one to another; our knowledge of this relation is by movements, in this case ocular movements. . . . By currents passing from the highest sensory centres, so to speak, "across" to the highest motor centres, and from these downwards, through middle and lowest motor centres to muscular periphery, there is development of movements of the eyeball. . . . Here we have . . . reflex action.

When one thinks of a brick, the reflex action is confined to the highest centers:<sup>2</sup>

The vivid image, the mental state we have (when we see a brick), arises during (not from) the physical condition in the two divisions of the highest centres, and is strongly and definitely "projected," because the lower centres are engaged; it *seems* part of the outer world. Next day, we can think of the brick in its absence, have "an idea of it," or, as I prefer to say, have a faint image, where yesterday we had a vivid image. In this case the reflex action is incomplete and weak; the lowest and the middle sensory centres and the middle and lowest motor are not engaged. The highest sensory and motor centres are alone engaged; there is still reflex action, but only the central links of the great sensori-motor chain are engaged; the central part only of the whole process which occurred in perception is done over again, and, the excitations being slight, the image arising is faint, and, the lower centres not being engaged, it is feebly and indefinitely projected, seems more part of ourselves.

It is convenient to use the expression "substrate of an image." Thus, in the sphere of visual imagery, the substrate of the vivid image "brick" refers to the pathways activated when one sees a brick; the substrate of the faint image "brick" refers to those activated when one thinks of a brick.

The substrate of a faint image, then, is part of the substrate of the corresponding vivid image; specifically, it is the topmost part. In other words, when the substrate of a vivid image is activated in its entirety, one has the appropriate vivid image—e.g., one sees a brick (it matters not whether the brick is "real" or "imaginary"). When, instead of the whole substrate, only its topmost part is activated, one has the corresponding faint image—one thinks of a brick.

1. Taylor, J.; Holmes, Gordon, and Walshe, F. M. R.: *Selected Writings of John Hughlings Jackson*, London, Hodder & Stoughton, Ltd., 1932, vol. 2, p. 69.

2. Taylor, Holmes and Walshe,<sup>1</sup> p. 70.



The faculty of representation is absent in infancy, and makes its appearance only in persons who have reached a certain level of cerebral evolution—a fact of fundamental importance in this inquiry. Children, contrary to common belief, have relatively poor imagination. A child, for example, can see a brick when he looks at it, but cannot easily think of it in its absence. The evidence for this statement is well known to psychologists; reference is made to a previous discussion of this matter.<sup>3</sup>

Why do children have poor imagination? The explanation lies in the fact that in childhood the highest cerebral centers are incompletely developed. The most complex of all nervous centers, they are the last to reach their full evolution. Since it is in these centers that the substrates of faint images lie (this, as I have already shown, being Jackson's opinion), it follows that in childhood such substrates either do not exist or exist only in rudimentary form. As the child matures, and as his highest centers evolve, the nascent substrates of faint images contained therein become more and more highly organized. The kernel of the explanation lies in the fact that the substrate of a faint image does not become a functionally useful mechanism until it is so highly organized that it can function independently of lower centers. Until then it is nothing more than a component of the substrate of the corresponding vivid image. The substrate of a vivid image is spread out over the lowest, middle and highest centers. When its topmost part (that contained within the highest centers) is insufficiently organized, it has no independent activity of its own—all it does is to chime in when the rest of the substrate is activated. But when sufficiently organized, it is capable of activation when lower centers are idle and becomes the full-fledged substrate of a faint image.

The foregoing statement is in accord with the law that one of the measures of the evolution of a nervous center is its ability to act independently of the rest of the nervous system. Thus, a child just beginning to toddle is unable to do so save when he concentrates his attention on the act of walking. At this stage his walking centers are too poorly developed to be able to act automatically. As they evolve they become more and more organized, until they reach the point at which they can function independently of the rest of the nervous system. At this point he can walk even when completely absorbed in other matters.

My statement of the relation of evolution to the growing independence of the highest centers is in complete accord with the views of Jackson,<sup>4</sup> who said:

As evolution progresses the highest centres not only gradually develop (become increasingly complex, etc.), but also become more and more detached from, and

3. Levin, M.: Hughlings Jackson's Views on Mentation: Their Value for the Psychiatrist, *Arch. Neurol. & Psychiat.* **30**:848 (Oct.) 1933.

4. Taylor, Holmes and Walshe,<sup>1</sup> vol. 1, p. 375.

more independent of, the lower centres out of which they have been evolved. . . . There are degrees of detachment and of independence . . . (When independence has been attained) our highest sensory and highest motor centres (together the "organ of mind") can energise, to a large degree, independently of the lower centres out of which they have been evolved, and by aid of which they have been developed; consequently they can act independently of the environment.

The mature person, then, besides his ability (acquired in infancy) to have vivid images, possesses also the ability (acquired on reaching a certain level of evolution) to have faint images. He never has a vivid image under circumstances which should evoke a faint image. For example, when his train of thought leads him to think of a brick, or when he hears a speaker say the word "brick," he thinks of a brick but does not see one.

Now suppose that the person falls asleep and has a dream or that he becomes psychotic and has hallucinations. My supposition is that his hallucinations occur because his highest cerebral centers, being reduced to a lower level of evolution, have in some degree lost their power of independent activation. Activation of these centers by themselves is impossible or difficult; it is likely to be accompanied by activation of lower centers as well. Therefore, under circumstances which ordinarily produce activation of the substrate of a faint image (a substrate lying entirely within the highest centers), there is likely to be, instead, activation of the substrate of a vivid image (a substrate spread out over the highest, middle and lowest centers). Several illustrations of this proposition are given here.

#### OBSERVATIONS

The first three illustrations deal with hallucinations occurring in dreams. A dreaming person may have hallucinations regarding matters which he has thought about during the day, especially if he has thought about them just before falling asleep, and if they are matters which have made a deep impression on him.

OBSERVATION 1.—MacCurdy,<sup>5</sup> in his study of war neuroses, reported (p. 25) that the dreams of soldiers at the front, "have a purely war content, the setting of which is, as a rule, the section of the line in which the patient has last been, or that section in which he may have been subjected to most severe strain. The exact nature of the injuries which seem imminent in the dreams, naturally varies with the type of fighting in which the man has been engaged. The enemy is throwing bombs at him, which explode at his feet, he is about to be bayoneted, he is shot down in an aeroplane or shells are raining upon him."

This example reveals the relation of faint images occurring while one is awake to vivid images occurring while one is asleep. The soldier at the front is deeply impressed by such elements of the situation as the

5. MacCurdy, J. T.: War Neuroses, *Psychiat. Bull.* 2:243 (July) 1917.

shells, the bayonets and the injured—so deeply that he thinks of them almost all the time. When he thinks of them, he has faint images. For example, he may be thinking of an enemy soldier advancing with a bayonet; he does not actually see the enemy soldier but only visualizes him. This is what happens when he is awake, for then his highest centers are at a high level of efficiency; they may be activated independently of lower centers, so that he is capable of having faint images. When he falls asleep, he continues to “think” of the topics which have engaged his attention during the day, but since his highest centers are functioning at a lower level and are incapable of independent action, he has vivid instead of faint images: he sees the enemy soldier, instead of visualizing him.

**OBSERVATION 2.**—An intelligent young woman was visited by her brother and sister and several friends, who after the visit left in an automobile. A few minutes later she learned from a neighbor that an automobile had just been wrecked by a train not far away. She hurried to the scene of the wreck and learned that five people had been killed. A large crowd had gathered, and a long time passed before she could see the victims. During this delay, of course, she suffered the greatest apprehension, not knowing whether it was her relatives and friends to whom the accident had happened. Finally she saw the horribly mangled victims. She was relieved to find that they were strangers, but still the scene made a painful impression on her. For some time thereafter, in her nocturnal dreams, she saw the wreck taking place before her eyes. “I could see the train coming round the curve and saw it strike the automobile. There was a loud crash, and that always woke me up.”

In principle, this example is a duplicate of that of MacCurdy's soldiers and needs no comment.

**OBSERVATION 3.**—A college student, living at home, habitually sat up late at night studying, and his father often admonished him to retire earlier. One night the student sat up very late. He became sleepy, to the extent that he no longer grasped what he was reading. Suddenly he heard his father's voice saying gruffly: “Herb! Go to bed!” He immediately awoke, went to the next room (his father's bedroom) and discovered his father sound asleep and snoring.

*Comment.*—One may suppose that the student, whenever he sat up late, was disturbed by the idea of his father's disapproval. This idea, to be sure, was not constantly in the forefront of his consciousness. Only occasionally was he conscious of it. The rest of the time the idea was “in the back of his mind.” Nevertheless, one may assume that the nervous arrangements corresponding to this idea were always in a state of more or less excitation. (When their excitation passed a certain point, he was conscious of the idea; when it fell below this point, he was unaware, or only “dimly aware,” of it.) The important point is that so long as he was wide awake this excitation was confined to the highest centers (which in the alert adult are capable of activation independently of lower centers). Concomitantly, he had, not vivid, but faint images;

he thought of the words of benevolent disapproval which his father might be expected to utter but did not hear them. This changed the moment he fell asleep. His highest centers were no longer capable of independent action, and the excitation in question was no longer confined to them. Instead of thinking of his father's words, he heard them.

The examples thus far have dealt with healthy people. The next example is of hallucination in schizophrenia.

**OBSERVATION 4.**—A schizophrenic man aged 40 was admitted to the Harrisburg State Hospital in a delusional state, in which he thought that he was to be electrocuted. He made a good social recovery, with excellent insight. In giving a retrospective account of his psychosis he recalled that one day he was taken to the dentist's office. On entering the office and seeing the dental chair he thought that it was an electric chair and believed that his last hour had come. He sat in the chair, and the dental hygienist prepared to give him a treatment. When she turned on the current he thought that the moment of his electrocution had come, and he saw clouds of white smoke surrounding him and filling the room.

*Comment.*—To appreciate the significance of this example one must consider the reaction of a healthy man just before he is electrocuted. Electrocution is associated with the idea of burning flesh and of clouds of smoke. A healthy man about to be electrocuted might visualize these clouds of smoke; he would have a faint image of them. In the case of the schizophrenic patient, a vivid image occurred instead.

The examples given thus far are of hallucinations. The next two are of delusions. Hallucinations and delusions are regarded by some psychologists as two different phenomena, one being a disturbance of perception, the other a disturbance of cognition. While it is sometimes convenient to make this distinction, I have in a previous paper<sup>3</sup> tried to show that the two symptoms are congeneric. One may, therefore, make comparisons between hallucinations and delusions and show that a certain law applies to both.

**OBSERVATION 5.**—A man aged 37 with dementia paralytica gave during a remission a retrospective account of his psychosis. He recalled that he had had paresthesias in various parts of the body and had believed that there were insects crawling under his skin.

*Comment.*—A healthy man reacting to paresthesias might think of insects crawling under the skin but would readily appreciate that this is only a fancy. The psychotic patient, on the other hand, in response to the same stimulus had not a fancy but a belief of bugs crawling under his skin. A belief is to a fancy what a vivid image is to a faint image.

**OBSERVATION 6.**—A woman aged 40 with left hemiplegia associated with syphilitic cerebral endarteritis experienced a bromide delirium, from which she recovered. One circumstance noted in her retrospective account will be cited

here. The patient (Mrs. K.) and her next door neighbor (Mrs. D.) did not like each other. In the opinion of both Mr. and Mrs. K., Mrs. D. was a selfish, envious person, with whom they could be on terms of politeness but not of friendship. Sometimes, when Mrs. D. visited them, she admired some of their pieces of furniture, and Mrs. K. thought that she detected beneath these words of admiration an unpleasant note of envy. During her delirium Mrs. K. believed that Mrs. D. had gained admission to her house and had stolen the coveted pieces of furniture.

*Comment.*—The explanation of this case is similar to that of the previous case. Mrs. K. regarded Mrs. D. as malicious and must have thought that Mrs. D. would resort to any means to rob Mrs. K. of her best things if only she could do it safely. Mrs. K. must have fancied Mrs. D. in the act of accomplishing, or in the position of having accomplished, the seizure of her property by theft or trickery. As long as Mrs. K. was well, these ideas occurred only as fancies. When she was delirious, they occurred as beliefs.

The examples thus far deal with hallucinations and delusions which are directly related to the corresponding faint images and fancies. Thus, in observation 4 the patient saw a cloud of smoke, while a healthy person in the same situation would only have thought of it. In other instances the relationship is indirect. For example, a faint image expressed in figurative language may correspond to a hallucination expressed in literal language. An example of this was given in a previous paper;<sup>6</sup> it deals with a dream hallucination of my own experience. I had examined a criminal and was pondering the report that was to be presented to the court. I continued my contemplation into the evening and, while falling asleep, pondered the question of determinism and free will. Becoming more and more sleepy, I reflected that this question is insoluble. I then had an image of a wooden chest; the chest was closed, and I "knew" that it was locked and that the key was nowhere to be found. I then awoke and realized that for a few minutes I had been asleep. There is a connection between an insoluble problem of metaphysics and a locked chest; the latter is a pictorial image of the former. A poet writing about the insoluble problem of free will might represent it as a locked chest to which no one can find the key. It is easy to understand why in the dream there was a concrete image of a wooden chest rather than an abstract image of an insoluble metaphysical problem. Abstract ideas are more complex than concrete ideas. A child can grasp the idea of a box, but not an abstract metaphysical idea. Consequently an abstract idea is likely to be translated when sleep supervenes into concrete (i. e., more primitive) terms.

#### SUMMARY

What the examples cited show is that while the content of the idea which enters a person's mind at a given moment depends on psychologic

6. Levin,<sup>3</sup> p. 868.



factors (his life experiences, etc.), the form of this idea—whether vivid image or faint, whether delusion or fancy—depends on physiologic factors, namely, on the fitness of the highest centers and on their ability to act independently of lower centers. Past and present experiences may conspire to cause a certain idea to enter one's mind at a given moment—for example, the idea of clouds of smoke (observation 4). If one's highest centers are healthy and are functioning at a normal level of efficiency, they will be able to act independently of lower centers; activation of substrates of faint images (substrates which lie entirely within the highest centers) will be possible; one will think of clouds of smoke (faint image). But if, as in psychoses and in sleep, these centers are reduced to a level of evolution sufficiently low, they will have lost their power of independent activation; their activation will be accompanied by that of lower centers; activation of substrates of faint images will be impossible, and instead there will be activation of substrates of vivid images (substrates spread out over highest, middle and lowest centers); one will see clouds of smoke (vivid image, hallucination).

## CONTRIBUTIONS TO THE PHYSIOLOGY OF THE CONDITIONED REFLEX

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### DEDICATION

It is a joy and a privilege to be one of those participating in the Seventy Year Jubilee for Adolf Meyer. This article is proffered with a full sense of its shortcomings as a positive contribution to the psychobiology for which he stands. The choice of this limited material was based on the fact that it represents a group of completed and related experiments. The laboratory from which these data are reported owes its origin to Dr. Meyer; it is therefore fitting and with a deep sense of personal gratitude for his encouragement and guiding criticisms that this survey of completed work is dedicated to him.

### HISTORICAL REVIEW

As early as 500 B. C. Pythagoras spoke of the brain as the central organ of the higher forms of activity, a view upheld by Hippocrates and Galen but denied by Aristotle. About the beginning of the nineteenth century the attention of early investigators, such as Gall and Spurzheim, was concerned with phrenology; in 1809 they referred mental characteristics to thirty-seven cranial bumps. Twenty years before Pavlov's first discoveries cerebral physiology had a beginning in the work of Fritsch and Hitzig, who mapped out the excitable areas of the brain (1870); this study was later verified and extended by Ferrier, Schäfer and Horsley. The importance of the forebrain had been demonstrated by the extirpation experiments of Flourens on pigeons (1830) and was later proved by Goltz for higher animals (1895). About the time of Goltz the concept of reflex action, which had existed since Descartes, was finding practical elaboration in the researches of Sherrington.

The psychology of the period, however, was inadequate and often trivial, as well as without method, in the study of the higher integrated functions, although James and Wundt initiated a real beginning in their experimental laboratories. Physiology, on the other hand, neglected or shunned mental phenomena, considering them unimportant or in a

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From the Phipps Psychiatric Clinic, the Johns Hopkins University School of Medicine.

category of a different order. The prevailing dualistic theory considered mind separate from the physiologic functions of the organism.

The idea of the conditioned reflex can be traced back through Dewey, Thorndike, Pavlov, Sechenov, Bidder and Schmidt, Locke and Descartes, and if one is more historically minded, to the association theory of Plato and Aristotle.<sup>1</sup>

#### RELATION BETWEEN THE UNCONDITIONED AND THE CONDITIONED REFLEX

Pavlov expressed the belief that certain laws operative for segmental reflexes, such as summation and induction, hold also for the conditioned reflexes. He had previously shown that the conditioned reflexes to different stimuli vary in strength, according to the analyzer through which they come (auditory, visual or tactual), as well as to the intensity of the signal used.

Carrying these investigations a step further in analyzing the differences between conditioned and unconditioned reflexes, I have shown in this laboratory, first, that the intensity of both the conditioned and the unconditioned reflex depends on the amount of food used in reinforcing the reflex and, second, that in intensity the conditioned reflex is roughly parallel to the unconditioned reflex.

The ratio of the unconditioned reflex to the amount of food given is a straight line function, expressed by the formula  $S = a + bQ$ , in which  $S$  indicates secretion,  $Q$  the weight of the food and  $a$  and  $b$  constants. However, the unconditioned secretion of the stomach and the pancreas has for its formula the equation  $S = bQ$ . Why is there a difference between the salivary secretion and the secretion of other digestive glands? It seemed probable that the measurement of the unconditioned reflex includes also the "hang-over" from the conditioned reflex. A reference to technic shows how this is possible: The conditioned stimulus is given ten seconds before feeding and a few seconds after feeding begins, but as the conditioned reflex from such stimuli, when measured alone without being followed by feeding, may continue for several minutes, it was thought that this prolongation would be added to the unconditioned reflex. Further work, however, showed that not only is there no summation but the unconditioned reflex has an immediate inhibitory influence on the action of the conditioned reflex. As this has been proved only for the conditioned salivary reflex, it would be dangerous to draw conclusions for the whole range of reflexes. For the salivary reflex, however, having varied the conditions in many

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1. A comprehensive review has been made by Clark L. Hull (in Murchison, C. A.: *Handbook of General Experimental Psychology*, Worcester, Mass., Clark University Press, 1934, pp. 382-455).

ways, I feel certain of the existence of such a law. A weak unconditioned reflex, e. g., the unconditioned reflex to 1 Gm. of food, will inhibit the conditioned response of many times greater strength, e. g., for 20 Gm. of food. The inhibition occurs in less than two or three seconds, but the development of technic at present does not allow one to state how much less.

This is another instance of the difference between the laws for unconditioned and those for conditioned reflexes. According to Sherrington's principle of the final common path, one may expect summation of allied reflexes, but inhibition of one reflex by the other when they are antagonistic. The case in question is plainly one of allied reflexes. If one accepts the salivary secretion as a measure of intensity, it cannot be said that the stronger reflex inhibits the weaker, for, as already mentioned, the conditioned reflex, even though much stronger, is inhibited by the unconditioned reflex.

The inhibition of the conditioned reflex when the unconditioned reflex begins has a teleologic explanation. The conditioned reflex set up by the action of the conditional signal for from five to ten seconds continues for from one to three minutes in the dog when it is not followed by the unconditioned reflex, and subsequently for a few minutes there are agitation and restlessness. When the unconditioned reflex sets in, however, all the conditioned activity is inhibited, and there ensues a quiescent period during which the animal is also refractory toward the same conditioned stimulus. The refractory period may last several minutes.<sup>2</sup> The natural inhibition of the conditioned activity frees the organism from the influence of past stimulations. This law may find a clinical parallel in cases of nervous disturbance in which there is overstimulation without expression or gratification.

In using varying amounts of food I attempted to pass gradually from excitation into inhibition or to determine whether there is a sharp dividing line between even a very weak excitatory process and a weak inhibitory process. Although this problem has not been finally solved, preliminary experiments have indicated that there is a sharp demarcation rather than a gradual change.

#### HUMORAL CONDITIONING

What processes of the organism are subject to adaptation by experience, and which remain more or less fixed and immutable during life?

In lower animals it is known that some sort of adaptation is possible even without any nervous system—in the words of Coghill,<sup>3</sup> “any

2. Some of this material I presented at a meeting of the Toronto Physiological Society, Nov. 11, 1935.

3. Coghill, G. E.: *Science* **78**:131-138, 1933. An excellent review was made by G. H. S. Razran (*Psychol. Bull.* **30**:261-324 [April] 1933).

protoplasm can learn"—and that as one ascends higher in the scale the acquisition of individual responses based on experience is relegated to more specialized nerve structures and finally to the cerebral cortex almost entirely. Whether responses (in higher animals) other than those that have a cortical representation can be modified by experience requires further investigation.

As representing a reaction that can be quantitatively recorded and can occur without the presence of the central nervous system, my colleagues and I<sup>4</sup> chose the increase of sugar in the blood following the injection of epinephrine in the investigation of this problem.

A series of four rabbits and three dogs were given injections of epinephrine preceded by the sound of the buzzer, for from fifty to sixty-five days for the rabbits and for over one hundred test days for the dogs. The rabbits were given subcutaneous injections of 0.5 cc. of a 1:1,000 solution of epinephrine hydrochloride and the dogs intravenous injections of from 0.5 to 1 cc. On the test days from 0.5 to 1 cc. of a saline solution was given in the same manner as the epinephrine and was preceded by the sound of the buzzer. In response to the injections of epinephrine the sugar content of the blood rose from 160 to 240 mg. per hundred cubic centimeters in the rabbits and from 125 to 300 mg. in the dogs, dropping off after a few weeks of the injections. In all the dogs tolerance developed.

In none of the animals was there any suggestion of conditioned hyperglycemia to the conditioning signals (buzzer plus injection of saline solution). Apparently, certain other components of the responses became conditioned, such as panting in the dogs.

Bykov (personal communication) obtained conditioning of the splenic movements to the injection of epinephrine when it was preceded by the sound of a metronome for from three to six seconds, and also a conditioned exchange of carbon dioxide and oxygen. Although the explanation of why some effects of epinephrine can be conditioned and others cannot involves factors too complex to decide at present, a chief difference is the time element. The rise in the sugar content of the blood comes not suddenly and quickly but slowly and, moreover, not until some minutes after the conditioning signals. One may say tentatively that the effects of epinephrine which have a cortical representation through afferent fibers (even though enteroceptive), as well as an efferent control, may be conditioned, while those without such adequate representation or efferent control fail to become conditioned.

Besides the results with epinephrine, other instances show that the total conditioned reflex differs from the unconditioned. In the ordinary food-conditioned reflex the unconditioned reflex consists of many components, the most immediate and evident of which are skeletal

4. These data were presented by Katzenelbogen, Loucks and me at the Fifteenth International Physiological Congress, Leningrad, U. S. S. R., Aug. 14, 1935.



(muscular) movements and the salivary (glandular) secretion. If one considers only these two—the movement of the dog toward the food and the salivary secretion—the conditioned reflex frequently shows only the single component of salivary secretion, with no motor component observable. Another example appears in experiments cited later in this article in connection with intraneural conditioning: The unconditioned reflex to stimulation of the posterior columns of the spinal cord may be flexion of a leg and generalized movements in other limbs, whereas the conditioned reflex may be abduction instead of flexion, with or without the generalized movements.<sup>5</sup>

From these experiments it follows that one should speak of “conditioning specific reactions” rather than of a “conditioned reflex to a drug”; some effects of epinephrine can be conditioned, and others cannot. The conditioned response to an agent or a stimulus may thus be selective, consisting only of part of the original unconditioned action and varying qualitatively as well as quantitatively. Thus, conditioned responses may differ considerably from the original reactions on the basis of which they were formed. Conditioning is a selective process rather than a duplication in toto.

#### ELEMENTS OF THE CONDITIONED REFLEX ARC: INTRANEURAL CONDITIONED REFLEXES

Most of the stimulations for the conditioned reflexes of the laboratory and many of those for the acquired reactions of daily life begin with the exteroceptive analyzers, i. e., where the surface comes in contact with the environment, and link this stimulation with others originating either in other exteroceptive analyzers or in the interoceptive analyzers, e. g., a sound used as a signal for cutaneous pain or for food. A few conditioned reflexes have been elaborated on the basis of stimulations proceeding from the proprioceptive analyzers; much of motor learning makes use of proprioceptive stimuli.

The experiments to be presented involve stimulations the points of origin of which are within the nervous system. For conditioning of such stimulations I suggest the term *intraneural*, in contrast to ordinary or *extraneural* conditioning, in which the stimulation arises outside the nervous system, to which it is transferred through a specialized receptor.

The simple reflex arc in vertebrates is composed of the receptor cell and the afferent element, the central connection and the efferent nerve. The simple reflex may occur in a spinal animal. It is, as emphasized by Adolf Meyer, segmental in character. The spinal animal, however, is incapable of individually acquired reactions. Adaptation to the environ-

5. Other examples were cited by Hull.<sup>1</sup>

ment of the individual organism is accomplished by a suprasegmental mechanism, involving for its perfect functioning in mammals the cerebral cortex.

In an effort to relate structure to function, to determine the anatomic elements on which the conditioned reflex is based, I have attempted, in collaboration with Drs. Loucks and Light, to eliminate successively the various parts of all the structures involved. Pavlov and others had shown that after decortication it was difficult or well-nigh impossible to elaborate the acquired reactions.

Our approach to the problem aimed at functional elimination rather than destruction of the various elements. The trauma of extensive destruction of nerve tissue, as in cortical ablation, was avoided, although we did not entirely obviate the situation analogous to the three-legged stool described by Adolf Meyer—the stool falls if any one of the three legs is destroyed.

#### ELIMINATION OF THE EFFERENT STRUCTURES

Previous experiments with paralytic drugs, such as curare and morphine, led to conflicting results: The results of Crisler<sup>6</sup> and Culler (personal communication) were in favor of the central connection as capable of functioning in learning without participation of the peripheral structures; the results of Harlow and Stagner were against this view. We avoided the poisonous systemic action of drugs by employing a surgical method, that of producing temporary paralysis by crushing the anterior nerve roots.

In four dogs the right hindleg was paralyzed by crushing the anterior nerve roots between the exit from the lamina interna of the dura mater and the junction with the posterior root. Before regeneration of the injured motor nerves, elaboration of a simple conditioned reflex (withdrawal of the leg to electrical shock) was attempted on the paralyzed side, although the animal was, of course, unable to make the actual movement of the paralyzed limb. When the generalized conditioned response (minus its specific component) became well established, as shown by howling and motor defense reactions, the training was discontinued—in each dog before any evidence of regeneration. After regeneration the conditioned signal was given always without shock, and it was followed by withdrawal of the formerly paralyzed leg—the appropriate and specific conditioned movement but one which was never possible during the period of training.<sup>7</sup>

We conclude that for learning simple acts, exclusive of complex movements depending on chains of proprioceptive reflexes from successive peripheral situations, the effector response (muscular movement

6. Crisler, G.: Salivation Is Unnecessary for the Establishment of the Salivary Conditioned Reflex Induced by Morphine, *Am. J. Physiol.* **94**:553-556, 1930.

7. Light, J. S., and Gantt, W. H.: *J. Comp. Psychol.* **21**:19-36, 1936.

or glandular secretion) is unessential; such learning is within the nervous system. This conclusion parallels the theory of Cannon and Bard<sup>8</sup> of emotion as essentially a central mechanism.

#### ELIMINATION OF SUCCESSIVE PARTS OF THE ANALYZER

I shall discuss the problem first from a strictly physiologic point of view. First, how much of the afferent arc of the unconditioned reflex can be omitted and the response still serve as a basis for the elaboration of the conditioned reflex? Second, how much of the afferent arc, i. e., of the analyzer, of the conditioned reflex can be eliminated with preservation of the function of making connections with executor organs, i. e., of synthesis?

##### 1. *Elimination of the Afferent Member of the Unconditioned Reflex.*

—A reflex movement of the hindleg was obtained by stimulating directly the dorsal root of a lumbar nerve. The stimulus was applied directly to the dorsal nerve to furnish the unconditioned reflex (movement of the leg), instead of, as in the usual experiment, applying a shock to the skin of the leg to cause a withdrawal. As in the ordinary conditioned reflex experiment, the shock to the dorsal root was preceded by a buzzing sound. After a few combinations the signal (buzzer) evoked the same movement as the induced shock to the dorsal root; that is, a conditioned reflex can be elaborated to a central excitation as easily as to the corresponding peripheral stimulus.

Operation: With the animal under ether anesthesia the muscles were separated from the spinous processes of the fifth, sixth and seventh lumbar vertebrae, and the spinal cord was exposed for a distance of 2 cm. on the right side. An induction coil was fitted over the fourth lumbar vertebra, after leveling off the spinous process. The electrodes leading from this coil were looped around the posterior root of the sixth lumbar nerve, about midway between its exit from the cord and its junction with the anterior root. The electrodes were insulated except at their point of contact with the nerve. They were fastened in place by a strip of cellophane around them and the nerve. The muscles were sutured with interrupted black silk, and the fasciae and skin were closed.<sup>9</sup>

A dog ("Jack") with electrodes on the dorsal root of the sixth lumbar nerve gave an unconditioned reflex of lifting the left hindleg. This was preceded by the sound of a buzzer one second before the unconditioned stimulus (the induction shock to the dorsal root). The conditioned reflex to the buzzer, i. e., lifting the left hindleg, began with reinforcement 62, on the fourth day of experimentation. This reaction became regular on combination 102, on the sixth day. Extinction of the conditioned reflex was begun at repetition 161 of the conditioned stimulus (Buzzer), on the ninth day, and became complete at trial 165, i. e., after only 4 repetitions

8. Cannon, W. B., and Bard, Philip: The Neuro-Humoral Basis of Emotional Reactions, in Murchison, C. A.: Handbook of General Experimental Psychology, Worcester, Mass., Clark University Press, 1934, pp. 264-311.

9. These experiments were performed in collaboration with Dr. R. B. Loucks.

of the buzzer without reenforcement. Restoration of the conditioned reflex was begun at repetition 197 of the conditioned stimulus, on the tenth day, with successful reestablishment of the conditioned reflex after 5 reenforcements. The dog was used altogether for thirty-three experimental days.

Similar experiments were performed on three dogs using stimulation of the posterior columns of the spinal cord at about the level of the sixth lumbar nerve. The induction shock to the cord was preceded for one second by a conditioned stimulus (buzzer). The unconditioned reflex was a movement, usually flexion of the ipsilateral hindleg, to stimulation of the cord by the induction shock. In all these dogs there was a conditioned reflex to the buzzer, consisting of general tension plus movement of the hindleg, which appeared first on reenforcement 107 (sixth day), reenforcement 120 (seventh day) and reenforcement 422 (twenty-second day) in the various animals, respectively.

Operation: The spinous processes of the fifth and sixth lumbar vertebrae were removed, and the spinal cord was exposed by an opening about 3 mm. in diameter, with the medial edge of the aperture about 2 mm. from the midline. After removal of the meninges covering the cord, the electrodes, the points of which were about 3 mm. apart in a longitudinal direction and 1 mm. apart in a lateral direction, were inserted through the opening, so that the points rested firmly on the posterior columns of the cord. The electrodes were carefully insulated except about the point of contact with the cord.

Stimulation of the sigmoid gyrus to give a leg movement was performed in this laboratory by my former collaborator, Dr. R. B. Loucks.<sup>10</sup> In three dogs which received about 600 reenforcements of the conditioned stimulus with the faradic shock to the motor cortex, there was no evidence of the formation of a conditioned reflex.

2. *Elimination of the Afferent Member of the Conditioned Reflex.*—Where along the route of the afferent nerve and its various segmental and suprasegmental connections may one apply the stimulus to be conditioned without destroying its function as a signal? In other words, to what internal stimulations can the organism make the union with the unconditioned reflex? By the methods described in the preceding paragraphs and the use of the buried coil technic, we found it possible to elaborate conditioned reflex signals from stimulation of the dorsal roots, the area striata and even the motor area of the cerebral cortex. Recent experiments undertaken in collaboration with Dr. W. J. Brogden have indicated that stimulation of certain parts of the cerebellar cortex may also serve as an adequate signal for a conditioned reflex.

In a dog ("Jack") previously used for elimination of the afferent arc of the unconditioned reflex, as already described, after the twenty-sixth day of using the buzzer as the conditioned stimulus for the induction shock to the dorsal root of

10. Loucks, R. B.: J. Comp. Psychol. 18:305-313 (Dec.) 1934.

the sixth lumbar nerve, the procedure was discontinued, and instead the induction shock to the dorsal root was transformed into a conditioned stimulus for a cutaneous shock to the skin of the right hindleg. The use of an unconditioned stimulus as a conditioned stimulus is not new, as Pavlov successfully transformed a destructive pain (unconditioned) stimulus of the skin into a conditioned stimulus for food. Thus, the new conditioned stimulus was shock to the dorsal root plus lifting of the left hindleg; the unconditioned reflex was the lifting of the right hindleg to the cutaneous shock. The proprioceptive stimulus of lifting the left hindleg can hardly be effective as the conditioning factor here, for proprioceptive reflexes usually take much longer to form than did these. Also, we ruled out the proprioceptive factor in similar experiments by injecting procaine hydrochloride. The conditioned reflex (lifting of the right hindleg) began on reinforcement 61, after which it disappeared except on reinforcements 70, 73 and 76. This experimentation lasted from the twenty-seventh through the thirty-third day of training.

The food-conditioned reflex was formed to stimulation of the area striata, with the use of the stimulating technic of the buried coil, as devised in this laboratory.<sup>10</sup> Stimulation of the motor area of the cerebral cortex was used in this laboratory, in the experiments of Loucks, as a successful signal for the cutaneous shock of the left foreleg.

#### COMMENT

Conditioned reflexes may be formed quickly on the basis of (1) an unconditioned reflex the effector or executor end of which does not come into play during the period of conditioning and (2) an unconditioned reflex the afferent end of which has been eliminated up to the dorsal nerve root of the lumbar region and to the lumbar region of the spinal cord, but not when the whole afferent arc up to the motor area of the cortex has been eliminated. On the other hand, the afferent end of the conditioned reflex may be eliminated by successive stages as follows: the peripheral portion of the afferent nerve, up to the dorsal root of the lumbar nerve, up to the spinal cord, up to the sensory cerebral cortex and, finally, even to the motor area (sigmoid gyrus) of the cerebral cortex, i. e., a stimulus applied to any of these structures can serve as an adequate change of environment or signal to make a functional connection with the unconditioned reflex. Thus, I feel justified in saying that the basic mechanism of motor learning is situated within the central nervous system. Exceptions would have to be made in cases in which proprioceptive sensations are necessary for complex movements, as my experiments refer only to a simple movement and not to a chain of movements involving proprioceptive stimuli and subsequent reactions to peripheral happenings, i. e., chain conditioned reflexes.

On the psychobiologic side, signals arising from various activities within the central nervous system (as well as proprioceptive stimuli) can function as conditioning stimuli as readily as stimuli falling on the external sensory organs. This laboratory is now concerned with



determining the efficacy of stimuli arising outside the central nervous system, in the sympathetic and the parasympathetic system, as signals for acquired reactions, i. e., conditioned reflexes.

With the conditioning of food reactions and some others, it is known that a certain emotional tension (related to hunger, pain or sex) is necessary for the formation of the conditioned reflex. For conditioning within the central nervous system (intraneural conditioning), there is no basis for asserting that an emotional tension, urge or feeling is essential. The current that my colleagues and I employed was fairly weak, so that we never saw evidence of pain in the animals. Furthermore, except in some instances in which an external movement occurred, there was no clear indication of any feeling; the dogs did not lift their ears, turn their heads, become alert or give any sign, even of orientation, to the stimulation of the cerebral cortex,<sup>11</sup> such as one sees in ordinary, extraneural conditioning on using any new signal or unaccustomed change in environment. That is, from close observation of the external behavior, one may assume that the dog had no feeling—certainly none that could be classified as pain or pleasure or as that generally associated with defense. Conditioned contraction of the spleen and conditioned diuresis, demonstrated by Bykov and Alexejew-Berkmann<sup>12</sup> for dogs, can hardly be based on feeling, for the human subject certainly is not aware of the secretion of urine by the kidneys or of splenic contractions, nor are these reactions concomitants of a feeling or urge at the basis of the conditioning. In lower animals no one would postulate feeling as a cause of conditioning and adaptation.

It would be much easier to think of conditioning on the grounds of biologic importance to the animal, of teleology in the sense in which Driesch employed it. Undoubtedly, many acquired reactions have their foundation here and also involve feeling, but my experiments do not fit into such a category; neither does conditioning of the knee jerk or the pupillary responses. At present one can go no further than to assert that, as a general law, there is an association of function with certain nerve structures, so that when a stimulus arises in any of the sensitive units in definite time relationships with another activity, the two activities tend to recur together. What determines which of the many coincident reactions become functionally linked and the laws governing them remain to be discovered. Adaptation between the

11. Although there was an orienting reflex on stimulation of the dorsal root and the spinal cord, indicating "awareness" of a new stimulus, there was no evidence of pain either then or in the stimulation of the cerebellum.

12. Bykov, K. M., and Alexejew-Berkmann, I. A.: Die Ausbildung bedingter Reflexe auf die Harnausscheidung, *Arch. f. d. ges. Physiol.* **224**:710-721, 1930; Die Ausbildung bedingter Reflexe auf die Harnausscheidung; bedingte Reflexe bei denervierter Niere, *ibid.* **227**:301-308, 1931.

periphery and the center (*Anochin*), the principle of integration as shown by Sherrington for segmental reflexes and by Adolf Meyer for psychobiology, also tends to keep the organism in equilibrium, but there is operative this other force of *function inherent in structure*, which may or may not pull toward a successful adaptation. By force of circumstances and structure, functions may become dysfunctions,<sup>13</sup> a fact of which students of psychopathology are aware. Contractions of smooth muscle, having once begun, proceed *nolens volens ad finem*, as pointed out by Adolf Meyer in describing the automaticity of sexual acts. Adaptation, equilibrium, integration and evolution are powerful factors, but not always is it true, as Pangloss taught Candide, *que tout est nécessairement pour la meilleure fin dans ce meilleur des mondes possibles*.

These deductions from our experiments are in general conformity with the correlations brought out by Herrick between function and anatomic structure and by Coghill for function and embryologic development and with the concept of Adolf Meyer of a dynamic ergasiology including both function and physical and organic factors.

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13. A recent striking example of this relation of function to structure, irrespective of the needs of the organism, is the response of the fetus in utero (shown in E. K. Marshall's laboratory by Snyder and Rosenfeld), before it can have any purpose for the organism and even when it may lead to disastrous results (drowning or pneumonia). In the present state of knowledge of these events, one cannot say more than that function is related to structure in such a way that when the respiratory units reach a certain development they begin to function, regardless of needs and external stimuli.

## THE DILEMMA OF GROWTH

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A long period of infancy with close maternal care is unique for the higher forms of life. This reaches a maximum in the human being, and from this springs much of his strength and versatility. Briffault,<sup>1</sup> in commenting on this, said: "It would appear that the congenital superiority of what are regarded as the higher races of man consists essentially in a slower rate of development, owing to which the fixative force of natural heredity is counteracted by a more prolonged modifying operation of the social environment."

This period of slower development during which the infant is provided with the essentials of existence and is protected from the exigencies of independent living comes largely through the maternal relation. The mother fulfils the basic need that an infant has for another human being. This differs in various cultural strata only in detail. She or her substitute constitutes the early reality of the child. Through her the child receives life, and through her comes the impetus and opportunity for development. She provides both nutriment and safety, and in providing these she becomes a prototype for the new self, which emerges from the differentiating process of growth.

The infant at birth reaches a point of physiologic differentiation which makes separate living possible, but only through the continued help provided by another. The infant, as a newly integrated entity, is in a relatively undifferentiated state. His awareness of self is so fused with the mother that so far as he is concerned, he does not exist as a separate entity. He lives through her, not because she is the mother in a biologic sense but because she is available to provide protection, nutriment, affection and direction.

The phenomenon called growth is a "differentiation of live individuals" from each other. The newly created infant goes through a process of "waking up," which Meyer<sup>2</sup> designated as a positive process characterized by spontaneity.

The waking up takes place in a world of people and events. The infant wakes up to the reality of his own separateness, but since this

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1. Briffault, Robert: *The Mothers: A Study of the Origins of Sentiments and Institutions*, New York, The Macmillan Company, 1927, p. 35.

2. Meyer, A.: Spontaneity, in *A Contribution of Mental Hygiene to Education: Program of the Mental Hygiene Division of the Illinois Conference on Public Welfare*, Chicago, 1933, p. 25.

always takes place in relation to the others, from the beginning he gains a sense of his own difference from others and yet retains a sense of similarity and of being related to those from whom growth differentiates him.

Growth as a psychobiologic phenomenon takes on reality for the child through the use and direction of energy that originates within himself and that through use acquires a quality of uniqueness and difference. Through action the child discovers that he can begin to control his own existence and maintain it without the more total giving by the mother characteristic of intra-uterine life and the first days of separate living.

Along with these early awakenings of self arising from experiencing a capacity for action comes both an awareness of their uses and an awareness of their limitations. In the very fact that he cannot always keep the mother with him comes both a feeling of separateness and an awareness of not controlling all the movements of another person. Early he has the opportunity to discover what he can do and what he cannot do, and in the normal growth process the doing and the limitation of doing, emerging together, lay the basis for creativeness in the new self of the child. This early awareness of limitation comes partly from the limited capacity of the child, but an equally important source is the cultural framework in which he lives and adapts. It is obvious that individuation is a social phenomenon and that the mother provides the main avenue through which the directing forces of a culture impinge on the child. While she is guided by custom, she introduces important modifications because of the quality of individual difference achieved in her own growth. The degree of acceptance of her own difference will determine her capacity to allow the emergence of difference in the child she has created. The first awakenings of a capacity for action in the child occur, therefore, in a social but individualized setting, which can allow spontaneity but at the same time define a framework to give direction and purpose and limitation to the emerging actions of the child.

I discuss these general points to bring out important aspects of growth around which certain dilemmas emerge. The child, as he directs his own capacities, begins to change. He begins to move out on his own course, which involves leaving the safe and protected haven of infancy. His changing is the evidence of the adaptation to the ever new—partly created by his own change, but also by the changes taking place in others and in the nature of his setting. The adaptation to these changes by the child and others reveals some of the dilemmas that universally are a part of growing up, and the exaggerated responses of both mother and child, as they try to effect a solution, constitute much of the clinical field of child psychiatry.

First, I shall formulate the dilemma from the point of view of the parent, with particular emphasis on the mother. Although this paper is concerned primarily with the growth of the child, a clearer statement of the child's problem will be possible if first I define some aspects of the mother's dilemma that develop around her relation to the child.

The mother has achieved through her own growth a self that attains biologic maturity in the creation of a child. She finds in the child a new entity created by herself; he represents more than a product of naturally integrated physiologic functions—he is the creation of her own will and becomes related to the variety of emotional reactions reflecting the quality of integrity she has attained within herself. The child is an extension of herself, and the mother has the responsibility of directing the growth steps of the new self she has created. Around the child will revolve the joys and fears, the anticipations and dreads, the loves and hates which characterize her own reactions about herself in a reality requiring responsibility and involving relationships with others.

To guide the growth steps of the child requires that the mother give a great deal of herself. She directs with the only experience she has, an experience which has accrued as a result of her own growth and enlightenment; naturally she patterns the child in her own image. A mother recently said of her child: "I want my son to become the type of man I can admire." This is an understandable statement of a goal and is no more than a statement of the broader goal of any culture which seeks to perpetuate in successive generations of persons qualities and traits found to be useful and generally approved. Life, in whatever form it exists, distrusts differences that indicate a wide deviation from a general pattern. The term "black sheep" has become a symbol of nonacceptable differences and describes one who has altered too drastically a cultural pattern.

The dilemma for the mother can be formulated in this way: How can she direct and guide the life she has created toward a personally and socially acceptable goal and yet allow the emergence of a separate and different self? How can she give all that she must give without engulfing the child and making him no more than a product of her own will for whom she will continue to feel full responsibility? How can she encourage creativeness in the product of her creation?

The dilemma for the child, who in growing moves out of the total eclipse of infancy into an awareness of the separateness of himself, becomes somewhat easier to formulate as one understands the nature of the adult problem. However, it would be a mistake to think that the child's dilemma is created by and therefore exists only because of



failure to effect a satisfactory solution of the adult's own dilemmas. That mistake has been frequently made and represents a misunderstanding of the nature of infancy. A child is an active participant in his own growth, and a dilemma exists for him irrespective of, although greatly influenced and exaggerated by, the adult's attempt to solve his own part of the difficulty.

The child is a product of forces that operate entirely outside himself. However, life that obtains its start through the operation of external forces continues only through the gradual taking over of the responsibility for direction and the achievement of its own integrity. Into this process he will put more and more of himself, and in doing this he emerges as a person in his own right. How does he acquire the courage to be a self different and separate from the self that creates him? The very setting of his growth provides a stage for a more negative reaction, in that he finds himself patterned by forces that are not of his own making and over which he has no control. And yet, growing up is a positive process that happens as the child comes to accept the emerging self as his own, which he is creating with the use of his own energy. Earlier I quoted a mother who wanted a son to become the type of man she could admire. This boy, like any child, has the growth dilemma to solve as he comes to feel that in being what his mother has wanted he is at the same time being himself and not a synthetic product of his mother's will. Stated in another way the question is: How can he conform and adopt patterns of behavior defined by another and at the same time feel a sense of originality which comes through feeling that he, a separate person, is determining the nature of his response?

These are ways of defining the dilemma of growth. How it is solved may be understood more clearly as one sees it expressed in the behavior reactions of children who need therapeutic assistance. From such observations may come a broader understanding of basic phenomena determining the individuation. In order to secure a clearer picture of some of these dilemmas from the point of view of the child, I shall discuss some material brought out by a 10 year old boy who was brought to the Philadelphia Child Guidance Clinic for treatment because of his fearful attitude about school.

This boy developed in a family setting providing a background of individual adequacy, economic security and a cultural atmosphere characteristic of a good American home. The home was described by the mother as "a place where we have a lively good time together but where we are all just as different as we can be in temperament." Three older children, two boys and a girl, aged 19, 17 and 13, respectively, had attained their own individual maturity with some turmoil but without definite difficulty. The father had acquired professional success, partly in following a family pattern, but largely through the consistent use of his own

ability. The mother, able and determined, was the dominant member of the household. She had held the goal of individual independence for her children and had tried to apply the philosophy of "giving independence" rather than letting it emerge. Both parents gave considerable time to their children but had not been absorbed by them. They had maintained their own interests.

As a child, John was a peaceful member of the family and was known for his quiet and rather serious disposition and his desire to conform to the expectations of others. He was timid of new experiences, but there was no outward sign of disturbance until he started school at 6. At this first step away from home and into an experience of his own he was afraid. It required considerable reassurance by the mother and the teacher to keep him in school. By careful handling and many efforts to smooth his way he was enabled gradually to overcome the fear and to go ahead.

For three years he developed fairly naturally. His school work was of high quality; he acquired a number of interests, and other children seemed to like him. Gradually the fear returned and focused around a particular boy, who was described as friendly, vigorous and a leader in his group. The fear developed that this boy was against him, although no factual evidence was discovered to explain the fear. As the fear developed, he demanded more and more of his mother, who in her desire to help him responded by giving more and more to him. Gradually her own life was closely controlled by the boy's fear. She was at home for all his lunches and was always ready to bring him from school. In addition, she would telephone to him through the day to see if everything was all right. Frequently he would plead with her to stay at home "just so I can call up from school if it gets too bad." Many hours were spent in trying to explain away his fear, but these reassurances and explanations and various other ways of helping had only temporary value. After a year the mother presented to him the possibility of securing psychiatric help, and he seemed eager for it. Treatment was started and consisted of semiweekly interviews with the boy and weekly interviews between the mother and the social worker.

In selecting illustrative material from the nineteen interviews with this boy two major points were kept in the foreground: (1) aspects of the growth process to which some children respond with fear and (2) the manner in which a reaction which starts as fear soon becomes a struggle as the child utilizes and clings to this reaction to maintain a relationship natural for an earlier period.

All children discover themselves through others and to a considerable extent pattern themselves after these external affirmations of a self that gradually comes to be their own. In this way a child can bear the separating nature of growth without undue fear and a feeling of isolation as he becomes aware of his own difference. However, some fear is inherent in the growth process. The more the child tries to deny the reality of self by finding in others the idealization of himself, the greater will be the fear at those points at which he has to stand a little more on his own feet.

In the first interviews John revealed the extent to which he was living through other members of his family. As he tried to build up a verbal picture of his own adequacy, he kept emphasizing the adequacy of his brothers and other members of

the family and his need to be like them. Certain of his remarks illustrate this. "It is nice to know you have brains in the family." "My brother and sister stood at the head of their class, and I have to keep up their reputation." "I have to be good in art work"—a remark that followed a description of his mother's success in this field. It became clear that John was trying to be every one in the family except himself and that he felt that his only chance of achieving success was to duplicate in himself what others had done. Growing into his own life seemed to involve leaving all that was safe and sure, and he was fighting against this.

To be different seemed wrong and bad, because it seemed to imply criticism of the others. When he said: "I sort of want to be different," he followed at once with "It's good to have a nice family; we all like each other." It was as if he had said "It is wrong to be different from those who are so nice." Each assertion of himself seemed to stir this same question about his having any rights of his own. In settling a convenient time for our interviews he completely brushed his own rights aside and said: "Any time that suits you suits me." This denial came out stronger at a later period, when he described his puzzle in these statements: "When I see something funny and laugh but others don't I wonder why I should laugh. . . . If I don't like a thing I don't think I should say so because some one else might like that same thing."

Children react in different ways to this important problem of difference. There is a tendency to react in a total way, and this is probably a characteristic of childhood. To be different at all means to some children to be totally different. It had a good deal of that meaning for John, who seemed to react to a new experience as if it were a total thing in itself. For example, in the first interview he described how adequate he was and told of his various achievements. Later, when he began to talk about his fears he said: "If I tell you about it, then you may not believe those other things." The picture of strength he had built was unreal, not because he exaggerated his achievements, but because he made that represent his total self. If he revealed his worries which represented weakness, the picture would become just as total on the other side. Reassured of my accepting both sides of himself, he went ahead and said with some daring: "Sometimes I don't want to be just like my brother." These reactions reveal an important dilemma around the acceptance of difference. If he accepts the reality of his own difference, that at once becomes a total thing and makes him feel detached from every one. In one interview he said: "I feel that I am so different from every one." There was fear in this, and he described the feeling of loneliness which his more total conception of difference inevitably created.

With another child who was equally puzzled about this problem there was an attempt to solve the dilemma by refusing to accept any similarity to any one. She made bizarre efforts to be different. She said: "I want people to believe that I am different. At a party I found that I was having a good time like every one else, and I went over in a corner and stayed there." John tried to deny difference; she tried to create it artificially.

Most children are conformists and do not like to differ in such externals as their appearance and manners. They want to feel they are like those who are approved and unlike those who are disapproved. All children continue in their relations together to live partly through each other. Their friendships and antagonisms are closely related to the

discovery of themselves. The more confident the child is, the less intense become his attachments and antagonisms, indicating a lesser need to find himself in another.

As John began to talk about his suspicions and fears, it soon became clear that he was attempting to do at school what he had been striving to do at home—to find confirmations of himself in others and to live through them. He was trying to fit himself into the mold achieved by one boy in particular and was then utilizing the fears which emerged out of the impossible nature of his task to maintain a controlling relation with the mother. His own descriptions supply a clear picture of what he was trying to do. In this attempt to submerge his own self and become a pattern of another, he had to know all they were thinking. "They come to my house and play, and I don't know what they are thinking." "They try to be my friends, and I get suspicious." "I don't know what they think; I have to be sure from myself; if they tell me then I am still not sure." "I know my weak spots, but I don't know theirs. I sort of put myself in their place, and it doesn't quite fit and then I get suspicious." "I am trying to believe that I am like some one else, and I do wonder what they are doing and what they are thinking." "I get suspicious of those boys who are different from me."

This brings me to the second point. Fear, as it arises around the growth process, can provide the child with a powerful means of controlling the external influences which require of him more responsibility for his own growth. Fear, particularly in a child, removes many requirements and melts many demands which normally would be made. The fearful child seems to need much protection and reassurance, and usually they are given. At the time when he needs certainty, he is accorded more vacillation and giving in. Thus, he becomes caught with his fear, largely because others give way before its relentless power. Fear can become the major means of clinging to those external sources of safety that the child has been afraid to leave. Thus, a vicious cycle is established as the child organizes his determination around clinging to his fear.

John, at the age of 6 years, had his first experience with the value of fear when normal requirements sent him to school. As a result of the fear every effort was made to smooth his way, and from the experience he emerged with a firm hold on his mother. But the picture of a determined, controlling child did not become sharply outlined until treatment helped him to focus on the struggle he was having, with little attention directed to the actual content of his fears and suspicions.

Treatment was for this boy the first step in giving up his fears. The picture he presented in treatment showed some fear, but as he went on it was more a picture of a determined boy clinging to the idea of fear. A few scattered statements graphically illustrate this. "I just about can tell in the morning what I am going to worry about during the day." "I sort of like to get suspicious of some people." "I sort of promised myself that I would not keep a suspicion more than five days." "I never quite like to let a day go by without having a worry." "I like to know my mother is thinking about me." He brought this

out as he was telling how he had her telephone to him at school each day, and he justified this on the basis of being worried over the possibility that something would happen.

As he began to improve and was moving away from his fear and his determination to cling to the idea of fear, the struggle came out more clearly around the changes which, to a considerable extent, he was associating with treatment. Again his words illustrate this clearly. One day I commented on his giving up some of his worry (which was true), and he answered in a determined way: "I haven't given them up yet." In the twelfth interview, when according to his mother he was considerably improved, he said: "I sort of feel that I shall not give up my worries before I go away this summer. I sort of think of not wanting to give them up. You can imagine why." I asked him why, and he replied: "Because I'm not quite ready to. . . . I want to give them up, but I want to do it the right way." A little later he said: "I want to stop worrying, but I won't let myself give it up." Here he had focused his determination around the present experience of treatment and was trying to prove that his improvement was his own and not the result of giving in to another. Instead of dealing with this as resistance and something to be broken down, it seemed to me more important to strengthen him in this effort to discover what he was doing for himself and to give him something for which he could feel responsible. He began to feel that it was his job and that he could undertake it. This was a measure of finding something in himself that he could accept as his own, the more responsible use of which would solve some of his growth dilemma. Along toward the end he made this statement: "I know that you understand all these things but I don't and that I have got to understand them myself. When I first came to you, I thought the most important thing was just to tell them to you, and now I know the most important thing is to get them back in me."

Another important dilemma for the child deserves brief consideration. For every child there is a conflict over big and little, which in many instances shows itself as a determined fight against authority. The child who has gained a healthy sense of his own littleness in relation to the bigness of others and the world he lives in is the child free to use creatively the capacities which are his. His strength can exist in relation to greater strength. He neither is submerged by it nor has the need to feel that he must always be on top.

Toward the end of treatment John again provided a penetrating and important statement of this problem: "I sort of want to do something different. I want to have brains. The trouble with growing up is that you read about people being greater than you are. You read about what they have done and you sort of get discouraged. . . . You sort of feel you have to know everything to be ahead of every one. . . . As you grow you have to be smarter and smarter. A man who is four times as old is more than four times as smart." And then in a more relaxed way he added: "I sort of want to be wrong some of the time."

This case has been used in some detail because the graphic descriptions of the child emerging out of his therapeutic experience give such clear illustrations of a reaction to the dilemma of growth. Like all children, he had the problem of discovering the reality of himself and of achieving through growth a sense of his own wholeness. Such a



feeling can never be detached from the self that is, nor can it be detached from the world of real events and relationships with others. Just as there is no life without a setting, there can be no sense of wholeness without a merging of those inner realities which constitute the awareness of self with those external realities in which these feelings are lived out in action. The child who has found through living this sense of balance, with an acceptance of the self that is his, with both potentialities and limitations, becomes the adult who can meet the dilemmas of the growth drama he initiates with a sense of freedom that comes from knowing that he is a person in his own right. The child does not have to become the fulfilment of a need to perpetuate self in another. The dilemma will remain for each succeeding generation, but the solution will be found with less turmoil as the adult brings to this ever recurring drama a sense of his own wholeness.

## A TYPE OF NEUROTIC HYPOMANIC REACTION

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In an issue of the ARCHIVES which does honor to Adolf Meyer it is not necessary to apologize for, or explain, the apparently loose and unorthodox term that appears in the title of this essay or to assure the reader that there is no intention in it to postulate a new "disease." Rather, the title is intended to call attention to a picture encountered not infrequently, especially in psychoanalytic practice, and it was chosen by analogy with similarly loose current terms, such as "neurotic," "psychogenic" and "hysterical" depression. Dr. Meyer wrote:<sup>1</sup>

I do not share the holy horror of the *Ding an sich* or *noumenon* entertained by some people; it is well that we should have concepts and words for the totalities even if they never can be realized as wholly indisputable entities. For both scientific and practical purposes, it is, however, wisest . . . to choose one's noumena or ideal entities and bedside terms as closely as possible to where one can actually work and not to sacrifice our progress to the old notion of unitary one-name "diseases" where many facts call for consideration.

It is in this spirit that I describe the type of reaction I have in mind.

Cases of transient elevations of mood with the accompanying motor and verbal push, which last from minutes to days, are not rare in psychoanalytic practice. Besides these petit attacks, there are also to be discerned by the experienced eye certain hypomanic equivalents: ambitious enterprises, artistic or scientific "inspirations," sexual celebrations, fights, alcoholic sprees or more diffuse states of being generally "keyed up." The state to be considered in this essay is a more chronic and subtle one, which may have prevailed for years before the analysis is begun and may then persist for an indefinite period. The patients come to analysis for various reasons: They are generally unsettled in life and dissatisfied with their sexual adjustment and the way they are getting along in their work, or there is a crisis in marriage or in their business career. Some one of these reasons brings them to an acute realization of the precariousness of their adjustment. Usually, in addition, they tend to center their complaints on an obvious presenting symptom, such as sleeplessness or indigestion.

The patients start analysis and have hardly begun to give an account of themselves before the analyst is struck by their immense enterprise

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1. Meyer, Adolf: The Aims and Meaning of Psychiatric Diagnosis, Am. J. Insanity 74:163 (Oct.) 1917.

in daily affairs. Their lives consist in an endless series of appointments, parties, social activities and activities that lie outside their calling. These activities are in the main such as might ordinarily be pursued as hobbies or for some special interest, but here they are chosen as if haphazardly; the patient enters on them abruptly, becomes involved as if in his life-work and as abruptly drops them. While these activities are in the foreground, they absorb a remarkable amount of passionate interest and energy, day and night. Similarly, a vast number of persons figure in the patient's daily life, with all of whom he has dramatically intense but extremely short-lived relationships. In the analytic hour the patient devotes little attention to introspection but is absorbed in relating little dramas of the day, with their ever changing cast of characters, which enable him to "act out" the chief tendencies of his instinctual make-up.

The attitude to the analyst varies from respect to flippancy, and in spite of intelligence and a sufficient understanding of the general purpose of the analysis it seems as if there is little interest in getting at the motives underlying the material. A dream is related; a few casual associations are given, and the patient returns to his dramatic recital. Moreover, such insight as may be gained from the study of a given event may be accepted as an intellectual treat or with the gleeful expectancy of using the knowledge "practically" in some trivial fashion for the immediate furtherance of some, often fantastic, design. The analysis of a conversion symptom, a compulsion or an anxiety is welcomed for the relief it brings, but there is no incentive to pursue the lead into the depths. The pertinent analytic material comes out almost incidentally and chiefly in relation to certain persons of importance in the patient's life.

In the overt sexual behavior, the patients may be completely abstinent, or they may be inhibited or conditioned by neurosis. However, when the overt sexual behavior is relatively free from neurosis, it tends to be promiscuous, but not casual, in the sense that there is an immense glorification of each new sexual partner, often with allegations of great sensual gratification and intense ephemeral jealousy. However, the marvelous mistress or lover is quickly and painlessly abandoned, heedlessly and with no sense of responsibility or conflict. There is surprisingly little sense of guilt. Usually there are more guilt and conflict about masturbation, but these, too, are ordinarily quickly dispelled by a few reassuring words from a physician or an authoritative person. Masturbation is usually performed without individual fantasies, aided by pornographic reading or pictures. The love affairs referred to are noteworthy for the fact that in them the sexual pleasure and the emotional elements are of secondary importance; each affair is a caricature

of a *mariage de convenance*. The other party is by no means a prostitute or gigolo but some one who would be a "good match" in the worldly sense, a person of social, professional or financial importance, and the Casanovesque quality is a camouflage for the distorted worldly ambition. Sometimes the patient is aware of his ultimate ambition to marry "well" and seeks his cure in such a marriage. The marriage then does not work well, for the relation is disturbed by an overestimation of the mate, to whom are attributed all the virtues but who is at the same time envied and quarreled with in the most childish way—who is, in short, treated as an incomparable, totally responsible arbiter of the patient's destiny.

More obviously than the sexual life, the activities that lie outside the work proper are all in the direction of winning prominence and fame. The activities chosen are not so frivolous as to give the impression of pure play, as in manic psychosis; rather, the patients appear as irresponsible dilettanti, or when the activities are more readily rationalized as legitimate side-interests, they take them up with all the eagerness of new toys, later to relinquish them as easily, so that they appear fantastically inconstant. Yet each of these games, too, sounds like a "success story." In brief, the general impression obtained from the mass of activities, sexual, social and quasiprofessional, is that the patients are sacrificing their time, energy, health and the possibility of establishing firm, satisfying relationships in order to obtain a travesty fulfilment of ambition.

Why these patients are so impetuously insistent on the immediate attainment of popularity, success and prestige becomes clear in the light of their life histories. As children they led their classes and shone in athletics. Before this they were intensely competitive with siblings, when there were any, and as most of the patients were only children or the oldest of their generation, they found little difficulty in establishing their supremacy. As to the relation to the parents, one finding is of great importance: There is an almost complete amnesia for all events involving one of the parents and for all that parent's characteristics. Uniformly, this parent is of the same sex as the patient and, in all cases under consideration, either died when the patient was between 5 and 10 years of age or was otherwise removed from the family life, through divorce, separation or illness. The few memories that are retained from infancy concerning this parent are of being spanked, punished or mistreated by him. In spite of this and in spite of information from relatives or friends that hints at the parent's egoism, worldliness or eccentricity, the patient endows this parent, often consciously but certainly emotionally, with all the attributes of greatness. The deceased father becomes in the patient's imagination a brilliant man, a genius;

the mother, a perfect housewife, with great social and artistic talents. Owing to accidental circumstances in particular cases, my first impression was that there might be a real basis for the overestimation, but this impression was not to be confirmed. In other cases it was shown that the ideal of the absent parent was definitely due to the child's imagination and that the parent's real merits merely served as an aid to the fantastic idealization—a process which came to full bloom only after the death or separation.

With this anamnesis the patients' behavior becomes more intelligible. They appear to be trying to compete with or live up to an imaginary ideal of perfection, ability or success, which they attribute to an absent parent. As an initial formulation, it might be said that they are in their behavior fantastically fulfilling ambitions which the absent parent had for them; but as an explanation this is insufficient. The hectic desire for fame and renown is soon readily interpreted as a wish for some sort of immortality. It is an attempt to pattern after an absent parent, one who is not dead but immortal. The dream life constantly reveals the unconscious belief that the parent did not die (or leave the family). The absent parent lives on, as it were, in the patient, and it is as though the patient led not his own life but one that is a grandiose idealization and travesty.

Before this state is reached, other processes are utilized to annul the absence of the parent. Before puberty (after the death or departure of the parent), a violent effort is made to transfer the relationship to the remaining parent, who must then, as it is popularly stated, be both father and mother to the child. If this parent spoils the child and can, to a great degree, fulfil this double rôle, the child is satisfied for a time and forms an intense attachment to the remaining parent, forgetting (i. e., repressing or covering with incertitude) at that time the whole relationship with the absent one. Later in life a marriage may be patterned on this relationship to the surviving parent, so that the mate is given the same double rôle, which accounts for the overestimation of the mate and the subsequent disappointment in him. The ephemeral sexual affairs are travesties of this relationship. To a certain extent, too, the child takes the absent parent's place at that time, playing the little wife and mother, in the case of the girl, or engaging in the absent father's activities, in the case of the boy.

The factor which disturbs the pleasant relationship to the parent who plays two rôles and which starts the "neurotic hypomanic" mechanisms is puberty. The intense attachment to the sole parent accentuates the incestuous resurgence of that period. Uniformly among my patients at puberty came conscious, overt, incestuous feelings for the surviving or remaining parent. In several cases they appeared in frank dreams



of sexual intercourse. The patients were frightened by the eruption of incestuous sexuality, which seemed to come from the blue, and there developed neurotic symptoms. These varied in type. Often, after a brief period of homosexual relations or intense love for a person of the same sex, there began a period in which all sexual feeling was repressed and was manifested only in hysterical conversion symptoms. In other cases the same end was attained through protective compulsions, which followed the typical course of such phenomena. Compulsive praying at bedtime, originally that there might not be an erotic dream, later seemed to lose this content and became simply compulsive praying. Compulsive masturbation was intended as a prophylactic against the same type of dreams. Sleeplessness was essentially a vigil, undertaken as in the days of knighthood, to ward off "impure feelings" and incestuous dreams. Compulsive overwork served the same function by day. At the same time, the relationship to the remaining parent, which had been so satisfactorily placid, was disturbed and superseded by intense hostility and rebellion—part of an attempt at avoidance.

With this turning from the parent arose the necessity for dealing with the relationship to the absent parent. No longer could the remaining parent be both parents in one. Yet it was important that the unconscious relationship to the absent one be maintained. It then happened that the adolescent permitted the rôle of the absent parent to hypertrophy in him: The boy burdened himself with the rôle of the absent father; the girl, with that of the absent mother. They turned sharply from home to school, to athletics and to parties and later to professional and quasiprofessional enterprises, distracting themselves thereby from the sexual-incestuous environment. At the same time, in the new fields they strove to fulfil the identification with the idealized absent parent. The result ultimately was the picture presented at the beginning of this paper.

In the preceding discussion the person who is well read in psychoanalysis will note ideas put forth by Freud and Abraham in regard to manic-depressive states, such as the importance of identifications, formation of ideals and the loss of a beloved object. In a recent paper on hypomanic chronic states,<sup>2</sup> Deutsch stressed the importance of identifications in determining hypomanic behavior, as well as the extensive use of the mechanism of denial. A probable difference between the outspoken hypomanic state and the neurotic hypomanic reaction I have described in this paper may lie in the fact that the latter does not use the mechanism of denial. Instead of this, the patient represses or uses

2. Deutsch, Helene: Zur Psychologie der manisch-depressiven Zustände, insbesondere der chronischen Hypomanie, *Internat. Ztschr. f. Psychoanal.* **19**: 358 (July) 1933.

one of the obsessive mechanisms to deal with unwelcome psychologic facts. On the other hand, the use of identifications is common to both types. A relevant discussion of "postponed mourning" will be found in a paper by Deutsch, which has not yet been published. The present essay must remain a preliminary sketch of a broader undertaking that might determine the essential differences between the various pathologic pictures in this field.

In conclusion, it is fitting that I express my debt to Dr. Meyer, who saw clearly that there is an unsolved problem in the states "allied to manic-depressive psychosis."

## MODIFICATIONS IN A SCHIZOPHRENIC REACTION WITH PSYCHOANALYTIC TREATMENT

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The modifiability of schizophrenic reactions by psychoanalytic methods is a problem which has been much debated. I am reporting here the case history of a patient who came into analysis during her convalescence from a severe schizophrenic episode and who, in the course of that analysis, went through two subsequent upsets which were of diminished intensity and which showed progressively less schizophrenic and more affective features.

In the spring of 1933, a married woman aged 30 passed through a period of mild, unacknowledged depression which was characterized chiefly by an apathetic attitude toward friends, relatives and her 3 year old daughter, by difficulty in making decisions and by retreat into a routine of excessive smoking and intensive reading of murder mystery stories. In June, after a move to the country, the patient experienced insomnia and, for a few days, a certain amount of restless overactivity. Out of this background there developed a sudden and acute psychosis. She showed obvious, intense panic and great perplexity and occasionally alluded to delusional notions of kidnaping or persecution. On one occasion she started to wander away from home, which led to her being placed in a hospital, where in a setting of increasing tension, perplexity and confusion, there developed a short period of mutism and catatonic posturing. Later, during subsequent analysis, it was possible to fill out this picture with many details, which will be alluded to later.

The acute upset lasted about eight weeks and was followed by gradual and uncomplicated convalescence, of similar duration. After a short vacation with her husband, she returned to her home and entered analysis in September 1933.

About the nature of this acute episode there had been no doubts in the minds of any who had seen her. Most of those who had been called in consultation had given an unqualifiedly bad prognosis. I expressed the belief that the prognosis for the acute attack was good but concurred in the opinions of the others that, unless some form of successful treatment could be instituted, the patient would suffer from recurring attacks, probably of increasing severity and duration, terminating, in all probability, in a permanent paranoid schizophrenic psychosis. It was recommended that an effort be made to modify the course of the illness through psychoanalysis, not with any promises of success but with the hope that one might at least ameliorate the unfavorable outlook. From the first, it was predicted that there would be recurrent episodes of illness during the course of the analytic treatment.

Because of the limits of this communication, no effort will be made to present any details of the subsequent years of psychoanalytic investigation and treatment, except when these are necessary in order to trace the clinical course of the patient's illness.

The first weeks of analytic work unleashed a torrent of retrospective data on the acute illness from which the patient had just emerged—data which demonstrated the florid and extravagant nature of the delusional processes which had been at work, but most of which she had kept masked during the tense and suspicious phases of the illness. Thus, she had imagined that she was under constant surveillance and that she was the center of a plot to trap her into damaging admissions on the basis of which her child would be taken from her. She was the focus of an elaborate scheme of blackmail. Her daughter had never really been born, or if she had been born, there was no way of proving that she was really her daughter, should the child ever be kidnaped. Her husband was her recently deceased father-in-law, in disguise. Her husband and mother-in-law were planning to kidnap the daughter. Daughters, worthy mothers and grandmothers were all to be kidnaped together and transported to some island, for experiments in homosexual breeding, but the patient was ruining the scheme and therefore would have to die. She must save herself from destruction by leaving her finger-prints on all objects in the room. The pictures in the room kept changing to scenes of her childhood. Confusion arose as to whether her own father was dead or alive. Eyes were watching her from all shiny surfaces. She doubted whether she had ever been married and whether, if she went to sleep, she would ever awaken. Again, she felt sure that she was surrounded by homosexual male patients. The masseuse was really a man dressed as a woman; as the patient laid her hand in the masseuse's lap, she felt an invisible penis. The massage itself was masturbatory preliminary love play which would lead to intercourse. She herself was a hermaphrodite, and she attempted to urinate like a man. Various investigations of intestinal functions, which had been undertaken unwisely at this time, were also fitted into her delusional scheme.

These samples of her profuse productions served to establish beyond doubt the essential nature of the illness.

In the first weeks of analysis the patient did little but discharge the pent-up panic by pouring out memories of all this confusion. She discussed it freely, wrote it out several times and dreamed fragments of it again and again. In this reworking and reliving of the experience of illness it became evident that injudicious handling of the situation during its earlier phases had nearly precipitated her into suicidal efforts. On the one hand, the neurologist's thoughtless use of colonic irrigations and massage had thrown her into acute homosexual panics. On the other hand, an ill-timed and brutal confrontation of her with some partial evidence of latent homosexuality by an untrained pseudoanalyst had given her the feeling that there was no escape from all this except through death. I secured the first positive reaction from the patient when, on being introduced into the picture, I terminated all such violent nursing and medical attention, allowed the patient a maximum of seclusion and gave her the companionship of a silent, unobtrusive and passive nurse; furthermore, I attempted no verbal rapport with the patient until she was well able to tolerate it in small doses and without panic.

The first winter of analytic work yielded little external evidence of progress. After the initial outpouring of material, it became necessary to engage in an incessant struggle against the patient's obstinate efforts to repress all important psychologic data, whether immediate, recent or remote. Probably the most that can be claimed for this first winter of work was that the patient for the first time began to have the courage to face certain facts about her life—facts which were obvious to all her friends and to her family but from which, with char-

acteristic solicitude, they had shielded her, and which she was too pathetically timid ever to have faced alone. Thus, she came to recognize the blinding terror which dominated every human relationship: terror of her dead father and her brother, fear and hostility toward her mother, incessant terror of her husband and his family, obsequious fear of her servants and even of her 3 year old daughter and of all her friends. She saw that she spent her life between placating and hating, and she realized that, historically, this was in some way all connected with jealousy of her brother, jealousy of the girls he liked, deep-seated shame about masturbation and acute jealousy toward women. In the analysis, as in her life for years past, she maintained a lethargic and evasive attitude, through which it was only rarely possible to break, and then only for a moment. Thus, it was months before a sufficiently strong relationship had been built up to make it possible to induce her to relinquish her escape into florid and murderous mystery tales. This deprivation became effective only when she began to catch a glimmer of insight into the secret gruesome satisfaction which these pictures of death and destruction afforded her. This insight eased her at the same time in another important direction. She lost a severe phobia that her child would be run over, when she began to sense that this child represented to her all the hated girl rivals of her puberty and adolescence and that, in fact, she was obsessed with secret and triumphant fantasies of the child's death.

In May a series of strains occurred, which threw the patient into a new episode of illness. Her mother and stepfather sailed for a prolonged stay abroad. Her husband had to go away for a few days on a business trip, on which he used for the first time an exceptionally expensive, large and high-powered automobile, which had just been given him, at the same time that the patient had been given a Ford. More important than any of these events, however, was the fact that just at this time her husband's closest friend announced his separation and impending divorce. With increasing panic, the patient faced the implications of this move for her husband's life—correctly, for she knew that her husband's attachment to this friend was a much deeper bond than he himself realized, a bond based on fundamental identifications. It was not a chance coincidence that the husband at this time used a slight cold as an excuse to withdraw from all sexual life with the patient and to sleep in his study rather than in their bedroom. The period of slowly but steadily mounting anxiety finally culminated in a mild hypomanic swing and then a renewed outburst of deeper panic, with increasing confusion. It became necessary, after ten days, to move the patient to a nursing home for a few weeks. This time, however, there were no outspoken delusions, but at times there were much confusion and unhappy puzzling and questioning: Had I learned accurate facts from her husband? Was there anything wrong with her body? Was there anything strange about her father's death? At other times, momentarily, in a ranting, emphatic, protesting, assertive or querulous voice, she talked rapidly, with true flight of ideas by *Klang* associations, but without elation. She referred to the delusional material of her first illness by saying that the thought kept coming to her that similar things were happening around her but that she knew this was not true.

The panic, confusion and excitement subsided rapidly in the nursing home, and within a few weeks the patient was taken to a quiet home for convalescent patients in the country, where she moved slowly through a mild depression, from which she made a gradual and uncomplicated recovery. After a short holiday at the seaside with her husband, she returned to analysis in the middle of September 1934.



There then began a much more profound and significant phase of the analytic work—a period of uninterrupted gain and progress which lasted for nearly eighteen months and during which it became evident to the family and to friends that out of the timid, frustrated, evasive and insecure person was emerging some one of much firmer substance and character. The reports that came to the family were not that the patient was "her old self" but that she was freer, firmer, more vigorous and gayer than she had ever seemed before. She undertook a daily part-time job and in it won for herself the high regard of her associates.

A detailed review of the nature of the analytic work during this constructive period will have to be presented elsewhere. Its major emphasis, however, can be summarized briefly. The patient became increasingly aware of the traumatic impact of her mother's anxieties, jealousies and attachment to herself and of their jealous rivalry for her brother and painfully conscious of the hurt which she had experienced through the indifference and rejection with which her scholarly recluse of a father had treated her. Above all else, however, she became aware of the passionate, eager, jealous attachments with which she had fled from her complex family scene to relationships with other girls and women. Long before this material could be thoroughly worked out in detail (for the patient was as ever a slow and resistant worker at analysis) and long before there could be any thorough emotional reliving and working through of this material, the patient was faced with the most severe blow which she could have had—a blow which, before she was ready for it, threw her directly on the problems of her unresolved homosexuality. This came about when she was suddenly confronted by her husband with a plan for an almost immediate separation and an ultimate divorce. Needless to say, the patient felt that it was wise, from the point of view of herself, their child and her husband, to hide her hurt and avoid all recriminations. Therefore she pretended to all except her own family and a very few intimate friends that the separation was the result of a plan mutually agreed on. Therefore, the outside world inevitably leaped to the usual hasty conclusion: that the analysis had caused the separation.

For a month the patient contemplated the proposed separation calmly and reasonably. Because of the many deep-seated neurotic difficulties from which the husband suffered and from which, because of his aggressive, self-righteous nature, he had always caused her to suffer, she could even anticipate many advantages from this separation. She went over the past and admitted that in the year preceding her first breakdown she had been struggling to hide from the realization that in her marriage she had an almost impossible task on her hands and that it was only timidity which had kept her from facing this fact at that time. Then came the husband's move to separate living quarters. Still for a month and a half she continued to live fully and freely, with a feeling that for the first time in her life she was ready to live on an adult and independent basis. At this point, however, her mother again left the country, for an unavoidable prolonged stay abroad. Despite the hostile nature of the attachment that existed between them, within two weeks the patient's confident and healthy status was shattered, and she lapsed into a third short episode of illness.

In almost every way, however, this third illness was different from those which had preceded it. Only the succession of events at the onset bore the stamp of the old pattern: i. e., anxiety, followed by mild speeding up, which in turn was punctuated by recurrent moments of greater panic. This time, however, there was not even a semblance of formation of delusions. For a short period

there were a tendency on the patient's part to feel that there might be some "strangeness" or "coincidence" attached to every-day objects and occurrences and some perplexed overinterpretation of somatic sensations. This was all that was left of the *délire d'interprétation* which had marked the first illness and which had been so plainly recognizable below the surface of the second. A few rigid mannerisms and phrases crept in. Frequently she interrupted her talk with an impatient gesture and the words "skip it, skip it"; her customary facial and bodily mannerisms were all exaggerated, to a fixed and somewhat stereotyped degree. At no time in this illness, however, was there any need for hospitalization. For a few weeks she was more comfortable if protected from complex social demands by avoiding social engagements and utilizing the daytime companionship of a nurse; she was relieved of the care of her household and child. Throughout the illness, however, it was possible to keep up the analytic work; indeed, because of the patient's extraordinarily insistent drive, this led rapidly to one of the most profitable periods of deep investigation. During this period significant and hitherto repressed details of her early instinctual development came to clear expression, and with this the third psychotic episode subsided. Its exact duration is hard to indicate, because in about eight weeks all panic, pressure and perplexity had disappeared, leaving the patient in a somewhat subdued state of natural and inevitable depression. From this she emerged slowly and gradually. Thus, the major period of illness was one of sluggish and mild depression, which ran a slow convalescent course, as the analysis worked on.

So excellent had been her general level of adaptation during the months before her husband confronted her with his decision and so far reaching were the implications of the analytic work which she had done in the preceding year and a half that it is legitimate to doubt whether she would have had the last illness had she had more time in which to consolidate her new-won gains. His decision forced her prematurely to face certain deep-seated problems which she had only begun to uncover in the analysis and to trace to their origins. The impact of his decision on her, had it come a year later, might have had a far less disturbing effect.

#### COMMENT

The ultimate fate of the patient is not yet assured. Since the last illness nearly a year has gone by, again with slow but steady gains both in analytic insight and in the quality and apparent security of her adjustment to life. Nevertheless, this report is one not of a cure but of a gradual basic modification of a schizoid character and a striking modification of a schizophrenic illness, with lessening of the delusional tendencies and a shift toward simpler affective responses, in place of the down grade tendency which the nature of the first illness had led every one to expect. To what extent this modification of the illness is due to the analysis is difficult to establish at this stage of the work. However, when the structure of the illness is finally worked out, it may be possible to establish even this point with some degree of probability.

For the present, it is sufficient to describe the apparent influence of the analysis in three stages: 1. After the first illness the analytic work helped the patient to accept the fact of her illness, to face certain aspects of the raging hostilities which she hid beneath her saccharine

and placating manner and to face certain of her own instinctual demands and the frustrations of these in her life situation as it was then constituted.

2. The interval of analytic work between the second illness and the third extended her knowledge of her psychosexual constitution to include certain grave homosexual inclinations and anxieties and laid the basis for a much more profound understanding of the early conditioning influences which had played on her emotional development. As a result, the whole tenor of her living shifted. From seclusiveness and a lifelong sense of social alienation, she became less constrained, social instead of asocial and firmer in her dealing with domestics and her associates in work, and for the first time she worked consistently and effectively at a useful job, in which she manifested an unexpected and high degree of ability.

3. This happy state of affairs was interrupted, of course, when the husband's sudden announcement precipitated the third illness. Since the third episode, however, the patient has worked through and out of her profound and bitter fear of and hatred for her mother, to a relationship of genuine friendliness, warmth and honesty. She has freed herself from the rivalry with her little daughter and for the first time has become in any true sense her daughter's mother. She moves in a healthful fashion among a widening circle of friends, at the same time keeping up her effective work. In this period there was successful analysis of her vast system of unconscious fantasies about illness and death, whereby she won her first freedom from fantasies about the supposedly ruinous effects of infantile masturbation.

During this phase of the treatment the analysis of the persistent compulsion to pick at her face uncovered the fact that during the weeks in which her first illness had been rolling up, the patient had indulged a secret and peculiar nightly orgy. Seating herself on the edge of the wash-basin, her face close to the bathroom mirror, for hours on end she would press, pick and squeeze at real or imaginary pimples on her face, in an irresistible frenzy, accompanied by almost orgasmic sensations. With lessened, but essentially unaltered intensity, this drive had persisted throughout the healthy interludes of her analysis, as well as the periods of illness, until as a result of certain specific analytic processes, the compulsion relaxed its destructive grip and practically disappeared.

However, many serious problems remain to be resolved. There are certain deep-seated obsessional tendencies which manifest themselves in a few compulsive mannerisms, some ticlike manifestations, minor dressing compulsions and the like. These indicate that the resolution of the psychotic tendencies will not be complete until these unmasked neurotic fragments can also be analyzed and resolved. This is obviously

the task that remains, but it is one in which one can hope for a considerable measure of success.

From the formal clinical standpoint, this case raises further problems of considerable interest. The patient was a timid person who throughout life had protected herself from all-inclusive terrors by an array of minor obsessional and compulsive rituals. These rituals hampered and constrained every detail of her living but did not manifest themselves in overtly neurotic behavior. Through this protective array of defenses the illness came, with a sudden rush. There was a preliminary flurry of anxiety, followed by a burst of false self-confidence in a mild hypomanic swing, which was accompanied by erotic fantasies of unwonted daring. These fantasies brought basic libidinal attitudes close to expression, which in turn released her sense of sudden danger. The resulting panic hurled her into confusion, perplexity and disorganization of ordinary thinking processes, with partial loss of the capacity to distinguish between reality and fantasy.

One wonders whether this sequence of events is always characteristic of the evolution of a schizophrenic illness in such timid and obsessional personalities and whether it would always be true, as it was here, that the indecision of the "normal" obsessional character would be represented in a subsequent psychosis by what Hoch pictured so vividly in his description of states of distressed perplexity.

## STUDIES IN SCHIZOPHRENIA

### CHEMICAL ANALYSES OF BLOOD AND CEREBROSPINAL FLUID

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The purpose of this communication is to report the findings obtained in a study of nineteen different constituents in the cerebrospinal fluid of twenty schizophrenic patients. These data were derived from special investigations of blood and cerebrospinal fluid withdrawn simultaneously and analyzed.

One hardly needs to emphasize the need for examining the blood and the cerebrospinal fluid of schizophrenic patients, because of the scarcity of accurate information in this regard. Nor is it appropriate to reiterate here the reasons outlined elsewhere<sup>1</sup> leading to the conclusion that analyses of these fluids, carried out under well determined conditions, allow a more accurate evaluation of the findings.

Taking into consideration that the term schizophrenia, or parergasia, is applied to a wide range and variety of psychotic manifestations and that the kraepelinian classification, for all its convenience, is hardly illuminating, I shall briefly describe the clinical picture presented by each patient and append the chemical analytic data. Thus, the whole material of this study—both the clinical and the laboratory data—is offered as objective observation free from subordination to a priori concepts.

#### PROCEDURE AND METHODS OF ANALYSIS

Blood and cerebrospinal fluid were obtained simultaneously from each patient before breakfast. The analyses were carried out by the methods described in the references. It should be noted that, because of the scarcity of methods specifically designed for the analysis of cerebrospinal fluid, one is forced to adjust the technic used in the clinical analysis of blood to the analysis of the cerebrospinal fluid. Adjustments of the same method made in different laboratories may produce changes likely to influence the results. Therefore, any modifications in procedure and technic introduced in this laboratory in the methods referred to are pointed out.

*Precipitation of Proteins in Blood and Cerebrospinal Fluid.*—In the analyses for sugar, nonprotein nitrogen, urea nitrogen, uric acid, creatinine, creatine and

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This research was carried out in the Henry Phipps Clinic through the laboratory facilities made available by Dr. Adolf Meyer.

1. Katzenelbogen, S.: *The Cerebrospinal Fluid and Its Relation to the Blood*, Homewood, Baltimore, The Johns Hopkins Press, 1935.



creatinine (total creatinine), and amino-acid nitrogen in the blood, the protein-free filtrate was prepared according to the method of O. Folin and H. Wu.<sup>2</sup> The precipitation of proteins in the cerebrospinal fluid for the analyses of the same constituents was carried out as follows: Ten cubic centimeters of cerebrospinal fluid was mixed with 1 cc. of 10 per cent sodium tungstate and 1 cc. of two-thirds-normal sulfuric acid. The mixture was allowed to stand from ten to twenty minutes. Then 38 cc. of distilled water was added, and this final 1:5 dilution was filtered through no. 50 Whatman filter paper. The acidity of the cerebrospinal fluid filtrates was found to be equal to that of the blood filtrates.

*Anticoagulation and Antiglycolysis.*—In the determinations of the sugar and lactic acid content, blood and cerebrospinal fluid were treated with sodium fluoride to prevent coagulation and glycolysis. For analyses of blood, potassium oxalate was used as an anticoagulant.

*Methods of Analysis of the Blood and Cerebrospinal Fluid.*—Sugar was determined by the method of Folin;<sup>3</sup> nonprotein nitrogen, creatinine and creatine plus creatinine (total creatinine), by the method of Folin and Wu;<sup>2</sup> urea nitrogen, by the method of Karr;<sup>4</sup> uric acid, by the method of Folin;<sup>5</sup> amino-acid nitrogen, by the method of Folin;<sup>6</sup> total and free cholesterol in the blood plasma, by the method of Yasuda;<sup>7</sup> cholesterol in the cerebrospinal fluid, by the method of Plaut and Rudy<sup>8</sup> (from 2 to 5 cc. was used for analysis). Lactic acid was determined by the method of Peters and Van Slyke;<sup>9</sup> total protein, albumin and globulin in the serum by the macro-Kjeldahl method,<sup>9</sup> and in the cerebrospinal fluid, by the method of Kafka.<sup>10</sup> Inorganic phosphorus was determined by the method of Benedict and Theis;<sup>11</sup> calcium, by the method of Clark and Collip;<sup>12</sup> potassium, by the method of Kerr;<sup>13</sup> chlorides, by the method of Van Slyke,<sup>14</sup> and carbon dioxide-combining power, by the method of Van Slyke.<sup>15</sup>

In the analyses for amino-acid nitrogen and inorganic phosphorus in the cerebrospinal fluid it was necessary to prepare a series of diluted standards to obtain satisfactory colorimetric readings.

In the case of determination of the value for uric acid in the cerebrospinal fluid the final readings of the unknown were made against a series of diluted standards in tubes. The colorimeter was not used because of difficulty in reading proportional differences of color accurately.

2. Folin, O., and Wu, H.: *J. Biol. Chem.* **38**:81, 1919.
3. Folin, O.: *J. Biol. Chem.* **82**:83, 1929.
4. Karr, M. G.: *J. Lab. & Clin. Med.* **9**:329, 1924.
5. Folin, O.: *J. Biol. Chem.* **86**:179, 1930.
6. Folin, O.: *J. Biol. Chem.* **51**:377, 1922.
7. Yasuda, M.: *J. Biol. Chem.* **92**:305, 1931.
8. Plaut, F., and Rudy, H.: *Ztschr. f. d. ges. Neurol. u. Psychiat.* **146**: 229, 1933.
9. Peters, J. P., and Van Slyke, D. D.: *Quantitative Clinical Chemistry: Methods*, Baltimore, Williams & Wilkins Company, 1932, vol. 2.
10. Kafka, V.: *Ztschr. f. d. ges. Neurol. u. Psychiat.* **106**:54, 1926.
11. Benedict, S. R., and Theis, R. C.: *J. Biol. Chem.* **61**:63, 1924.
12. Clark, E. P., and Collip, J. B.: *J. Biol. Chem.* **63**:461, 1925.
13. Kerr, S. E.: *J. Biol. Chem.* **67**:689, 1926.
14. Van Slyke, D. D.: *J. Biol. Chem.* **58**:523, 1923.
15. Van Slyke, D. D.: *J. Biol. Chem.* **30**:347, 1917.

## RECORDS OF CASES

*Clinical and Laboratory Findings.*—The records describe the clinical features of the illness and any special behavior of the patient at the time the chemical studies were made.

For estimating the biochemical variables, normal standards obtained from various sources were used (Peters and Van Slyke,<sup>16</sup> Hawk and Bergeim<sup>17</sup> and Katzenelbogen<sup>1</sup>). All the laboratory data are assembled in the table. Only abnormal findings will be pointed out in the summary of each case.

CASE 1.—A man aged 23 was admitted to the Spring Grove State Hospital on Nov. 14, 1935. About five months before commitment, he became worried about his work. Three days before admission to the hospital he visited a girl. Persons who were supposed to take him home forgot about him. This upset him terribly; he wanted to be taken to his father, looked scared and did not know where he was.

On admission to the hospital, he walked into the office unsteadily, fell into a chair and started to cry, saying: "I can't breathe right; my lungs and my head hurt." He also said that the "postum" he drank at the girl's home went "upward in his head, backward into his forehead and into his lungs" and that he was being followed by union men, who sought to harm him. Then he kept his eyes shut and remained mute. On several occasions while sitting quietly in the ward he cocked his head to one side, as if listening to voices, and subsequently became agitated. He denied hearing voices.

In September 1936 he had improved markedly and was able to work satisfactorily on the farm. He was no longer apprehensive that something would happen to him. He expressed the belief that his trouble had been mental. He still had peculiar sensations in the head, but he called them imaginary. He still mixed poorly with other patients.

*Summary.*—The outstanding clinical features were delusions of persecution, bewilderment, indifference and peculiar somatic sensations. The duration of the illness when the analyses were made was about a year. No abnormality was noted in the blood or cerebrospinal fluid.

CASE 2.—A man aged 25 was committed to the Spring Grove Hospital on April 3, 1936. He had become ill about three months before, when he was found in Punxsutawney, Pa., wandering about in the snow, almost frozen. After a month's stay in a hospital in Pennsylvania, he was taken home. There he said that he was dying, and he refused to eat; he said that one side of his body was cold, the other side nice and warm. His head "felt funny;" he thought that the physicians in the hospital in Pennsylvania "fixed" him with "dope." Although he had never smoked before, he began smoking incessantly. He heard voices saying, "He is gone crazy." The night before his admission to the hospital he cut his wrists and said that he would rather be dead.

In the hospital he looked preoccupied and occasionally mumbled to himself; at other times he laughed without apparent cause. "Sometimes it sounds like somebody was hollering, 'You will die of a heart attack,' but I never saw anybody there." His judgment on formal testing was poor. He missed the Binet absurdities. He realized that there was something wrong with his mind.

16. Peters, J. P., and Van Slyke, D. D.: *Quantitative Clinical Chemistry: Interpretations*, Baltimore, Williams & Wilkins Company, 1932, vol. 1.

17. Hawk, P. B., and Bergeim, O.: *Practical Physiological Chemistry*, ed. 9, Philadelphia, P. Blakiston's Son & Co., 1926.

# Summary of Results of Tests

Case Number	Cells in Cerebro-spinal Fluid	Sugar*	Total Protein †	Albumin†	Globulin†	Nonprotein Nitrogen*	Urea Nitrogen*	Amino-Acid Nitrogen*	Uric Acid*	Creatinine*	Creatinine plus Total Cholesterol*	Free Cholesterol*	Free Cholesterol, Percentage of Total Cholesterol	Lactic Acid*	Inorganic Phos-phorus*	Calcium*	Potassium*	Chloride (Sodium Chloride)*	Carbon Dioxide-Combining Power, Volumes Per Cent
1	B† F R	80.00 61.00 61.00	7.66 26.00	5.42 20.00	2.24 6.00	33.00 12.00 0.36	13.00 6.00 0.46	7.00 1.30 0.17	2.4 0.2	1.40 2.00 0.50	4.80 2.00 0.42	70	56	12.70	3.80 1.30 0.34	9.60 4.90 0.51	21.30 13.30 0.62	686.00 734.00 0.83	58.00 53.00 0.91
2	B F R	97.00 67.00 69.00	6.68 25.00	4.54 21.00	2.14 4.00	40.00 16.00 0.40	17.00 9.00 0.53	7.40 1.30 0.18	3.3 0.3	1.00 0.80 0.50	6.30 2.60 0.41	66	42	13.90 9.30 0.67	4.10 1.40 0.34	10.20 4.90 0.48	22.30 17.00 0.76	594.00 737.00 0.81	63.00 57.00 0.90
3	B F R	79.00 59.00 75.00	7.10 15.00	5.23 12.00	1.87 3.00	28.00 14.00 0.50	12.00 9.00 0.75	7.20 2.30 0.32	1.9 0.2	1.30 0.70 0.54	6.00 2.40 0.40	47	30	13.10 8.10 0.62	3.60 1.20 0.33	10.10 .....	18.90 12.30 0.66	603.00 722.00 0.83	62.00 55.00 0.89
4	B F R	88.00 67.00 76.00	7.90 34.00	5.48 24.00	2.42 10.00	29.00 17.00 0.59	12.00 6.00 0.50	7.50 1.30 0.17	1.5 0.1	1.40 0.80 0.57	3.40 1.60 0.47	32	27	12.50 8.10 0.94	3.30 1.30 0.45	10.40 5.40 0.32	.....	596.00 746.00 0.80	72.00 71.00 0.97
5	B F R	90.00 71.00 72.00	8.10 32.00	5.51 20.00	2.59 12.00	27.00 14.00 0.52	15.00 6.00 0.40	6.80 1.40 0.21	2.3 0.3	1.50 0.80 0.53	4.00 1.60 0.40	41	37	14.80 15.00 1.65	3.40 1.50 0.44	10.40 5.30 0.50	.....	600.00 715.00 0.81	69.00 63.00 0.91
6	B F R	91.00 61.00 67.00	7.62 29.00	5.81 23.00	2.11 6.00	36.00 16.00 0.44	12.00 7.00 0.58	9.30 2.00 0.22	3.5 0.2	1.50 0.90 0.60	4.30 1.70 0.40	93	76	12.10 11.70 0.97	3.10 1.50 0.48	10.30 4.10 0.40	18.90 10.20 0.54	592.00 720.00 0.82	54.00 55.00 1.02
7	B F R	78.00 54.00 69.00	7.71 24.00	5.26 19.00	2.45 5.00	40.00 20.00 0.50	14.00 10.00 0.71	7.40 1.50 0.20	2.2 0.3	2.30 0.80 0.56	4.80 1.80 0.38	63	58	12.10 9.50 0.78	3.60 1.60 0.44	9.20 4.10 0.45	.....	570.00 669.00 0.82	56.00 56.00 1.00
8	B F R	..... 73.00 .....	7.52 20.00	4.75 15.00	2.77 5.00	33.00 16.00 0.49	14.00 8.00 0.64	8.00 1.90 0.28	2.3 0.2	1.30 0.80 0.62	4.60 1.90 0.41	.....	.....	31.00 47.00 0.66	2.30 1.40 0.58	10.40 .....	21.90 18.50 0.84	576.00 722.00 0.80	56.00 62.00 1.11
9	B F R	80.00 73.00 6.84	7.50 35.00	5.11 27.00	2.39 8.00	32.00 16.00 0.50	11.00 7.00 0.64	7.90 2.30 0.29	3.0 0.3	1.10 0.70 0.64	4.80 1.90 0.40	.....	.....	16.80 24.30 1.45	3.10 1.70 0.55	10.10 5.30 0.54	28.40 19.00 0.67	566.00 731.00 0.77	65.00 60.00 0.92

10	B	0	87.00	7.78	5.23	2.55	36.00	19.00	8.20	2.1	1.40	5.00	132.00	41	31	20.40	3.50	10.40	23.60	620.00	58.00
	F		73.00	18.00	13.00	5.00	17.00	14.00	1.50	0.1	0.70	2.00	0.25			20.80	1.30	5.00	16.00	723.00	63.00
	R		0	0.84			0.47	0.74	0.18		0.50	0.40				1.02	0.37	0.48	0.70	0.86	1.09
11	B	1	90.00	7.90	4.80	3.10	32.00	17.00	8.30	2.3	1.40	5.30	178.00	79	44	16.40	3.30	9.90	22.80	626.00	51.00
	F		70.00	....	....	....	17.00	13.00	1.30	0.1	0.80	2.20	0.30			24.40	1.30	4.70	16.20	724.00	56.00
	R		0	0.78			0.53	0.77	0.16		0.57	0.42				1.49	0.39	0.47	0.70	0.86	1.10
12	B	1	89.00	7.32	3.32	3.80	32.00	15.00	8.70	2.0	1.30	4.60	96.00	88	40	43.10	3.50	9.70	21.70	644.00	55.00
	F		69.00	28.00	23.00	5.00	18.00	14.00	1.30	0.1	0.80	2.10	0.25			18.00	1.40	4.70	19.20	734.00	56.00
	R		0	0.70			0.56	0.83	0.15		0.61	0.46				0.43	0.40	0.48	0.89	0.85	1.02
13	B	1	94.00	8.42	5.36	3.06	32.00	14.00	8.80	2.4	1.30	4.40	94.00	70	73	34.50	3.30	10.40	....	698.00	51.00
	F		69.00	20.00	13.00	5.00	13.00	11.00	1.30	0.1	0.80	2.00	0.25			16.40	1.30	4.50	18.00	736.00	55.00
	R		0	0.72			0.41	0.79	0.15		0.46	0.45				0.48	0.41	0.43	....	0.83	1.08
14	B	0	86.00	7.32	4.74	2.58	32.00	15.00	8.10	2.7	1.30	4.80	120.00	50	42	15.40	3.60	9.90	23.50	632.00	52.00
	F		71.00	24.00	18.00	6.00	14.00	10.00	1.30	0.1	0.70	2.10	0.35			21.40	1.40	4.40	16.70	742.00	60.00
	R		0	0.83			0.44	0.67	0.16		0.54	0.44				1.39	0.39	0.44	0.71	0.85	1.15
15	B	5	92.00	8.87	5.24	3.63	27.00	13.00	7.10	2.5	1.20	5.60	103.00	50	48	24.30	4.60	10.70	25.40	550.00	59.00
	F		60.00	40.00	32.00	8.00	14.00	9.00	1.30	0.2	0.70	1.80	0.30			12.20	1.80	4.80	16.50	706.00	56.00
	R		0	0.65			0.52	0.69	0.27		0.58	0.32				0.50	0.39	0.45	0.65	0.78	0.93
16	B	0	91.00	7.89	5.10	2.79	39.00	12.00	9.80	3.4	1.50	4.20	157.00	94	60	11.90	3.60	9.80	....	562.00	62.00
	F		61.00	26.00	20.00	6.00	12.00	8.00	2.10	0.2	0.80	1.60	0.35			9.30	1.90	4.10	....	732.00	56.00
	R		0	0.67			0.31	0.67	0.21		0.53	0.38				0.78	0.53	0.42	....	0.77	0.90
17	B	0	97.00	....	....	....	34.00	12.00	7.60	2.7	1.10	5.60	....	..	..	17.00	4.00	10.40	26.40	556.00	55.00
	F		48.00	22.00	18.00	4.00	13.00	7.00	1.60	0.2	0.60	1.90	0.34			28.50	1.40	4.60	17.40	718.00	60.00
	R		0	0.50			0.38	0.58	0.21		0.55	0.34				1.08	0.35	0.44	0.59	0.77	1.13
18	B	2	95.00	7.41	4.57	2.84	33.00	12.00	7.00	1.9	1.30	3.90	108.00	50	46	23.00	3.80	9.60	26.40	610.00	52.00
	F		53.00	20.00	15.00	5.00	13.00	10.00	1.30	0.2	0.70	2.50	0.25			9.90	1.20	4.80	22.50	734.00	54.00
	R		0	0.56			0.39	0.83	0.19		0.54	0.64				0.42	0.32	0.50	0.85	0.83	1.04
19	B	2	88.00	7.42	4.88	2.54	31.00	12.00	7.60	3.2	1.20	3.60	103.00	36	35	11.30	3.10	9.80	28.10	508.00	62.00
	F		60.00	20.00	15.00	5.00	12.00	....	....	0.2	0.70	1.80	0.18			7.80	1.10	4.80	17.50	722.00	57.00
	R		0	0.68			0.39	....	0.17		0.58	0.50				0.69	0.35	0.49	0.62	0.79	0.92
20	B	0	83.00	7.55	4.54	3.01	29.00	13.00	8.40	2.2	1.10	5.00	111.00	74	67	22.00	3.30	10.10	20.60	576.00	61.00
	F		55.00	22.00	16.00	6.00	15.00	8.00	1.50	0.2	0.60	1.90	0.38			32.70	1.40	5.50	16.50	722.00	56.00
	R		0	0.66			0.52	0.62	0.23		0.55	0.38				1.49	0.42	0.54	0.80	0.80	0.92

\* Milligrams per hundred cubic centimeters.  
† Milligrams per hundred cubic centimeters in cerebrospinal fluid; grams per hundred cubic centimeters in blood.  
‡ B indicates blood; F, cerebrospinal fluid, and R, the ratio between blood and cerebrospinal fluid.

Physically, he was undernourished and of asthenic habitus. He went through the fifth grade in school and succeeded well. After school he worked in a bakery, as a cook and as an orderly in a hospital. His personality was described as lively and full of fun. He had a good disposition and was happy and ambitious.

*Summary.*—The outstanding clinical features were delusions of being "doped," suicidal attempts, auditory hallucinations and peculiar somatic sensations. The duration of the illness at the time analyses were made was five months. No abnormality was noted in the blood or the cerebrospinal fluid.

CASE 3.—A single woman aged 19 was admitted to the Baltimore City Hospital (psychopathic division) on Jan. 27, 1934. She had delusions that people were trying to harm her. She ran from the house and threw herself in front of an automobile. Her education had ended at the first year of high school. She played the piano well. She was always seclusive and stubborn and shunned crowds. In the hospital she was withdrawn and uncooperative. She imagined that she was talking to God and heard His voice. She walked about laughing in an unsteady way, throwing her arms about. She frequently was resistive and combative and injured other patients. She was untidy in every respect, had to be cleaned numerous times daily, became destructive, tore her clothes and destroyed the furniture. On Jan. 4, 1936, she was transferred to the Spring Grove State Hospital, where her condition remained unchanged.

*Summary.*—The outstanding clinical features were delusions of persecution, suicidal attempts, auditory hallucinations and general habit deterioration. The duration of the illness before analyses were made was two years. No abnormality was noted in the blood or the cerebrospinal fluid.

CASE 4.—A man aged 28 was committed to the Spring Grove State Hospital on Aug. 25, 1931. In the hospital he stated that some one must be working against him. He was discharged as improved in December 1931. In February 1934, he was heard in his room cursing and arguing with imaginary persons, who were going to kill somebody. He talked constantly of either going himself or sending somebody to Germany for butchers; they were to bring butcher-knives with them to America and cut off the heads of these people. He was readmitted to the Spring Grove State Hospital on April 20, 1934. In the hospital he stated that many people, probably Negroes, were jealous of him because he had a knowledge of music. He visited a lawyer to tell him about his troubles. On Jan. 14, 1935, he told his physician: "Look what they have done to me. I am nothing but skin and bones. They want me out of the way, so that I can't break up their game. When I go to Baltimore City, there is going to be trouble; there is a guy who will have to be put behind the bars to stop this scheme." In February 1936 he said that he believed that there were people in Baltimore who were trying to confuse him and harm him in some way. He continued to believe that some one in Baltimore was responsible for his thoughts. On several days he refused to sit down, saying that the voices told him not to.

*Summary.*—The patient had delusions of persecution, preoccupation with murder and passivity feelings. The duration of the illness was five years, with nearly three years' remission. The uric acid content of the blood was decreased. The total protein and the globulin content were increased in the cerebrospinal fluid.

CASE 5.—A single man aged 32 was admitted to the hospital on March 10, 1934. Since 1928, after the death of his father, he had had periods in which he would sit around the house and not talk for days. Then he would talk incessantly, often mumbling to himself. In the hospital, in September 1934, he spent much time in grimacing, giggling and carrying on various postures. In January 1935



he became talkative; "Some of you smart guys had better join with the coppers; they run a new racket and make victims out of honest, respectable people. Go down to the Southwestern; that is where they operate; you cannot say anything, because they carry guns." After April 1936 he was increasingly careless about his personal appearance, sullen and preoccupied. He ceased asking to be sent home, as he previously had done, but he insisted, as usual, that "nothing is the matter" with him.

*Summary.*—The patient had delusions of persecution, general habit deterioration, lack of insight and periods of mutism. He had been hospitalized for two years, with intermittent periods of bizarre behavior for eight years. The values for cholesterol, total protein and globulin were increased for the cerebrospinal fluid.

CASE 6.—A man aged 21 was admitted to the Spring Grove Hospital on March 1, 1934. Two years before admission to the hospital he became more seclusive than usual. Since November 1933 he had spent a good deal of time mumbling to himself and wandering about the house in a sort of daze. About Jan. 1, 1934, he began to complain that a neighbor had put a spell on him. He heard her talking about him, accusing him of all sorts of vile acts. About the middle of January he talked a great deal about his first power of psychic hearing and his second power of psychic seeing.

In the hospital he saw a man "manhandling" him, rubbing his hand across his penis. He believed that these persecutors had planned to kidnap other members of his family, especially his sister to take out her womb.

In February 1936 he said that he was told by President Roosevelt by means of mental telepathy to watch the neighborhood and that he was controlled in some way by mesmerism.

*Summary.*—The outstanding clinical features were delusions of persecution, seclusiveness, passivity feelings, auditory hallucinations and "second sight." The duration before analyses were made was two years. The value for amino-acid nitrogen in the blood was increased. The value for free cholesterol in the blood was increased as compared with that for total cholesterol. The calcium content of the cerebrospinal fluid was slightly decreased as compared with that of the blood. The cholesterol content of the cerebrospinal fluid was slightly increased.

CASE 7.—A single man aged 26 began talking in August 1927 of people being after him, saying that these people had killed others and wanted to kill him. Since then, for nearly six years, he had had periods of restlessness and mutism, but had done most of the housework for his grandfather and his brother. On April 27, 1933, because of attacking his grandfather and throwing dishes through the window, he was committed to the hospital. There he stated that he had been hearing voices for the last seven years and that he saw people who came into his room and told him that they were God. He thought that he was controlled by "radio Edison," his family being behind this. He heard voices that told him not to go out of the house; he could not work because of the voices which talked to him constantly.

He was discharged in July 1934, and lived with his grandfather on relief. He would go out at night and just walk about to try to get away from the voices. He could not sleep because of the control over him by electric power. In April 1936 he was readmitted to the hospital.

*Summary.*—The patient had delusions of persecution, visual and auditory hallucinations and passivity feelings. The duration when analyses were made had been nine years, with three years of hospitalization. The calcium content of the cerebrospinal fluid was slightly decreased.

CASE 8.—A married man 29 years old was committed to the Spring Grove Hospital on May 17, 1936. About a year before he had complained to his wife that some of the men at the ice company, where he worked, were "doping" his cigarets and shaking some kind of "dope" around in the air to make him feel strange. Not long after that he began to feel that his wife was trying to put poison into his food.

In the hospital he stated that he had heard before and continued to hear both men's and women's voices telling him that his wife was running around with other men. He often noticed peculiar odors about the house and thought that his mother was trying to put poison or probably medicine into his food. He saw "sky-angels—yes, lots of them."

He had received a high school education and had attended business school. For eleven years he worked in an ice plant as a clerk and was considered a good employee. He married at the age of 20 and separated from his wife eight years later, in October 1935, a few months after the onset of his illness. His wife stated that he had always been active and energetic and had had little patience with any one who had less pep than he had. He never had close friends; neither could his wife have friends because he would say nasty things to them.

*Summary.*—The patient had delusions of being "doped" and auditory hallucinations—voices accusing his wife of infidelity. The duration of the illness when analyses were made had been about a year. The lactic acid content was increased in both the blood and the cerebrospinal fluid. The potassium content was slightly increased in the cerebrospinal fluid. The ratio of the potassium content of the cerebrospinal fluid to that of the blood was increased.

CASE 9.—A man aged 29 was admitted to the Spring Grove Hospital on May 5, 1936, believing that he had fluid flowing out of his head, feeling germs in his head and thinking that he was about to die. In the hospital he stated: "My mental activity is not right; something is eating on my mind; something got in my mind through my back; maybe my blood is poisoned, or some germ, I don't know; it has gone up my spine." He heard voices talking when no one was around him. "They are after me, going to get me or something." He was indifferent to the environment and entertained delusions of having difficulties with men with whom he was working.

*Summary.*—The outstanding clinical features were delusions of persecution, indifference, bizarre delusions and somatic sensations. The duration when analyses were made had been five months. The potassium content was increased in the blood and slightly increased in the cerebrospinal fluid. The cholesterol content was slightly increased in the cerebrospinal fluid. The ratio of the lactic acid content of the cerebrospinal fluid to that of the blood was high. The values for total protein and albumin in the cerebrospinal fluid were increased.

CASE 10.—A married woman aged 27 was admitted to the hospital on June 16, 1936. In the past three years she had looked preoccupied but would not say what was the matter with her; she did her housework well. In the four weeks before admission she could not sleep, being afraid that some one would kill her parents. She had been hearing voices but would not tell whose voices or what they said. In the hospital the voices were "all around. Both men's and women's voices. Sometimes good things and sometimes mean things. They accuse me of not keeping myself up to par." When asked why she suddenly rose to leave the examiner's office she said: "Some one seemed to be urging me to sit still and some force urging me to get up." She felt that she was married both to her husband and to the king of England. She thought herself to be "just as sane as any

one else" and well enough to go home. She had married in 1934. Her married life had been "happy" but she had had no intercourse, being "afraid." She was described as quiet, shy and reserved and as not making friends easily. She did well in school and was considered a bright child.

*Summary.*—The outstanding clinical features were delusions of persecution, passivity feelings, auditory hallucinations and a delusion of being "married to the king of England." Analyses were made three months after hospitalization. The potassium content of the blood was increased.

CASE 11.—A woman aged 47, separated from her husband, was admitted to the hospital on June 18, 1936. She believed that an electric chair was put into her room designed to hurt her or her brothers, sisters and a man friend, because they mistreated her. She went to the Catholic church, lit all the candles and broke some dishes, saying that she was preparing for her own wedding, that two of her friends had secured licenses to marry her. In the hospital she explained her conduct: "because an electric chair was put in my room and also wires were running to the beds. The way it was fixed the wires could drop in my head; also the ceiling could drop on my head; also the wardrobe was trapped. Because I made the alarm that the place was on fire. The floor was hot, and I saw red fire. I ran from the apartment on the street, then went to the church." In the last fifteen years she had been an inmate of the state hospital five times, each time with various delusions and hallucinations. At the age of 14 she had an attack of unconsciousness without convulsions for four hours.

She was described as being of violent temper and not tolerating opposition. Her schooling amounted to about eighteen months in a country school.

*Summary.*—The outstanding clinical features were delusions of persecution, passivity feelings and auditory hallucinations. The duration when analyses were made had been fifteen years. The patient had been an inmate of a state hospital five times. The value for globulin in the blood was increased. The cholesterol content of the cerebrospinal fluid was slightly increased. The ratio between the lactic acid content of the cerebrospinal fluid and that of the blood was high.

CASE 12.—A white married woman, aged 39, was committed to a state hospital on July 6, 1936. In January 1936, after separating from her husband, whom she accused of infidelity, she began to complain of "hearing voices" and accused the physician of the general hospital, in which she stayed one day, of poisoning her. In the state hospital she appeared sad, preoccupied and worried about "the loss of God, friends, home." She felt that she was being mistreated by "evil spirits." In the interview with the physician she suddenly began to cry because "I hear my brother's voice" saying "sorrow for sin." She saw faces everywhere on the walls. They are "evil spirits." She cried because "somebody makes me cry . . . I hope it is God." She thought that she was dead, that she must have died. She also admitted, however, that she must be alive and again "dead to the world." For all her wrongdoings—bad to her husband, stealing, lying—she was being punished by God, or evil spirits.

The patient was described as having always been morose and having few friends. She stopped in the sixth grade of the parochial school because she was "scared of the sister." In 1924 hysterectomy and removal of ovaries were performed; since then she had not menstruated.

*Summary.*—The outstanding clinical features were delusions of being poisoned, ideas of reference, auditory and visual hallucinations and a delusion that she was "dead to the world." The duration when analyses were made had been eight months. The amino-acid nitrogen content and the lactic acid content were

increased in the blood. The value for globulin and that for albumin in the blood were decreased. The potassium content was slightly increased in the cerebrospinal fluid. The ratio between the potassium content of the cerebrospinal fluid and that of the blood was increased.

CASE 13.—A single woman aged 29 was admitted to the Spring Grove State Hospital on Aug. 10, 1936. Since June 1936, because of the idea that people would either kill or poison her, she had quit four positions. On August 6 she attempted to jump out of a second story window. She thought that people were calling her vile names, that she saw her mother appear to her as a spirit by the side of her bed, that she saw snakes and that a grave reappeared to her on several occasions.

In the hospital she said that she had just heard a voice telling her that her father and mother went to the death chamber for her; then "I heard somebody talking about killing me." She stated further that she could not be happy as long as she was hearing things. In September 1936, she saw a vision in which she thought the devil appeared. In May 1936, she was struck by an automobile but received no injuries; after this incident she became "nervous."

She completed the sixth grade at 16. She was described as quiet, getting along well with family and friends.

*Summary.*—The clinical features were delusions of persecution and auditory and visual hallucinations. The duration when analyses were made had been about three months. The value for amino-acid nitrogen was increased in the blood. The free cholesterol percentage of the total cholesterol content of the blood was increased. The value for lactic acid and that for globulin in the blood were increased.

CASE 14.—A man aged 20 was admitted to the Spring Grove State Hospital on Sept. 15, 1936. For about a year he had talked about being in love with a girl working in a neighboring store, whom he thought to be the Governor's daughter. He spoke to her on two or three occasions; she ignored him and told him to leave her alone and not to bother her. Two months before admission to the hospital he became abusive to fellow workers in the bakery and then to his mother and sister, calling them names and threatening to kill them for separating him from the girl.

In the hospital he heard a girl's voice saying that "she has an awful father, and that is why she is that way to me, and when she is through she will devote her time to me. Also voices accusing me of playing with myself." He thought that a patient in the ward was his father, although he knew that his father had died. The sensorium was clear; judgment on formal testing was good; he had no insight into his condition—"nothing wrong I know of."

The patient had had epileptic attacks from the age of 8 years to the age of 15. He had always been a "good, kind boy, not interested in parties, games or girls;" he graduated from school at about 16. The father, a heavy drinker, died at 45 from arteriosclerosis; the mother was feeble-minded.

*Summary.*—The outstanding features were delusions of being separated by others from a girl who ignored him and voices accusing him of sexual misbehavior. Hospitalization had lasted for about one month when analyses were made. The cholesterol content was slightly increased in the cerebrospinal fluid. The ratio between the lactic acid content of the cerebrospinal fluid and that of the blood was high.

CASE 15.—A married woman aged 31 was admitted to the Spring Grove State Hospital on May 6, 1936. About two months before, she became negligent about

her housework and her personal appearance. She believed that people at the beauty shop were making faces at her, and she became suspicious and fearful of everybody. During ten days before her admission to the hospital she stayed in bed, complained of her stomach, spit, had to be catheterized and did not recognize relatives. She entered the hospital in a semistuporous condition and remained in the ward apathetic, hardly ever talking and having to be cared for. She assumed postures and held them for a considerable time, did not respond to questions and picked her face and neck. Her hands had to be dressed to prevent her from scratching the self-inflicted sores.

In August 1936 the patient was still mute and resistive and showed a marked tendency to mutilate herself, necessitating placing her in a camisole.

The patient's personality was described as kind, jolly and happy; she was a fairly good mixer until she lost her job three years before her admission to the hospital. Her childhood was uneventful, and she went to school to the seventh grade. The mother was an unstable person.

*Summary.*—The outstanding clinical features were habit deterioration, suspiciousness, mutism, posturing and a tendency to self-mutilation. The duration had been seven months when analyses were made. The value for blood globulin was increased. The potassium content of the blood was increased. The values for cholesterol, total protein and albumin were increased in the cerebrospinal fluid.

CASE 16.—A youth aged 18, in July 1928, suddenly became irrational, heard voices, complained of being too tall and felt that no one wanted to go with him. At home he would tear off his clothes, run about naked and wander about the streets in pajamas. In September 1928, in the hospital, he grimaced, postured and thought that he was an atrocious criminal, that he was accused of perverted practices with dogs and that his eyes were gouged out. From June 1929 to February 1931 he was out of the hospital and working. In February 1931, he became mute and then suddenly rushed out of the house into the snow half dressed. He was taken to the city hospital in a stuporous state; there he occasionally attacked those around him and struck his mother when she visited him. On May 21, 1931, he was admitted to a state hospital, where he talked to himself and showed much posing and grimacing. On June 15, 1935, after having been out of the hospital for about a month, he was readmitted, mute, resistive, combative, soiling himself, posturing and grimacing. From June 1935 to February 1936 he remained mostly mute. He spent much time laughing loudly and occasionally tore his clothes. At times he exposed himself and masturbated openly.

*Summary.*—The clinical features were general habit deterioration, acute excitement, auditory hallucinations, passivity feelings, mutism, posturing, masturbation and exposure of the genitals. When analyses were made, the duration had been eight years, with two years of remission. The value for amino-acid nitrogen in the blood was increased. The cholesterol content of the cerebrospinal fluid was increased. The calcium content of the cerebrospinal fluid was slightly decreased.

CASE 17.—A single woman aged 27 was admitted to the hospital on Aug. 3, 1933. Eight months before admission she had been frightened when a cat was thrown on her couch by her brother. She screamed; then for six hours she alternately wept and laughed. She told her mother that what frightened her was her brother's mouth, which formed the letter "O," a symbol of the Virgin Mary, which meant that she was the Virgin Mary. For two weeks she held herself very erect, telling her mother that a bone had been removed from her back. Then she became excited and hyperactive, accused her parents of poisoning her food, believed that she had been kidnaped from her real parents and assumed an



arbitrary Christian and family name. In the hospital she talked of a tower built "because I am a virgin and some one was coming to get me out on Thanksgiving." In April 1935, when she returned home on parole, she entertained the same delusions about not being the daughter of her parents, whom she did not recognize as such. In October 1935 she became mute; she refused to eat, became unmanageable and was returned to the hospital. In November she spent most of the time lying in bed, holding her hand very stiff with the thumb adducted to the palm. She showed marked blocking in speech.

*Summary.*—The clinical features were general habit deterioration, bizarre behavior and talk about being the Virgin Mary. The duration had been three years and eight months when analyses were made. The lactic acid content of the cerebrospinal fluid was slightly increased. The ratio between the lactic acid content of the cerebrospinal fluid and that of the blood was increased. The value for potassium in the blood was increased.

*CASE 18.*—A girl aged 16, a brilliant student, became uncertain about her school work and daily functions. She gradually grew restless, talked little and was unable to sleep. She was committed to the Springfield State Hospital; she became untidy in eating, dressing and habits of urination and defecation. In March 1929, after eight years in the hospital, she was transferred to the Spring Grove State Hospital. There, she remained (to the time of writing, September 1936) mute most of the time, occasionally speaking in a most grotesque manner, blurring out words in an explosive way and in a high, cracked voice. She was unable to dress herself properly, walked around with a smiling, happy face, wildly gesticulating, and was not accessible to conversation.

*Summary.*—The outstanding clinical features were general habit deterioration, inaccessibility and bizarre behavior. The duration had been fifteen years when analyses were made. The value for potassium was increased in the cerebrospinal fluid and was slightly increased in the blood. The ratio between the potassium content of the cerebrospinal fluid and that of the blood was increased.

*CASE 19.*—A married woman aged 25, the mother of three children, was admitted to the hospital on March 31, 1936. Since her marriage, in the last eight years, she had been gradually growing careless of her personal appearance, neglecting her children and not speaking for months at a time. She feared that some one was trying to harm her and take her children from her. Since August 1935 she had visions of a deceased brother, described by her as terrifying. In the hospital she was careless of personal hygiene. She complained that people said things she had in mind, using her thoughts in some strange way. She put a clean dress over a soiled one and wore a bathrobe and a coat over the dress on warm days. She was indifferent and apathetic. When talked to she usually giggled and replied: "Oh, I don't know; I want to go home."

*Summary.*—The clinical features were gradual habit deterioration, mutism, a feeling of being influenced and visual hallucinations. The duration had been eight years at home and one year in the hospital when analyses were made. The value for potassium in the blood was increased.

*CASE 20.*—A single woman aged 21 was admitted to the Spring Grove State Hospital on May 9, 1936. Since February she had sat about a great deal, had not talked much and had had frequent crying spells. About one month before coming to the hospital she awoke at 3 a. m. and ran into an aunt's bedroom looking frightened, screaming, shaking and saying over and over that she would die. On May 1 she stopped working—sewing in a factory—seemed exhausted and complained of being tired all the time. In the evening of May 4, while sitting

outside on the steps of the house, she suddenly began to scream and shout at the top of her voice, as if she were frightened. She stopped screaming, went into a neighboring store, walked behind the counter and helped herself to a fountain drink, after which she told bystanders that there would be some excitement, that they would turn in a fire alarm. She also told one of them to take a gun and hold it to the door of her aunt's home and to shoot her if she came out because "She ain't no good." Then she did not want to go home, because it was filled with spirits and they would kill her. When taken home she continued to scream and kick, saying: "I always knew you could hex people; you have put a spell on me." She was described as mannerly, pleasant, retiring and seclusive. She went through the tenth grade at school. In the hospital she has been mute, except on one occasion, when she screamed out that she was going to die.

*Summary.*—The clinical features were acute excitements, mutism in the intervals, bizarre delusions and behavior and crying spells. The duration had been five months when analyses were made. The value for globulin in the blood was increased. The lactic acid content of the cerebrospinal fluid was increased. The ratio between the lactic acid content of the cerebrospinal fluid and that of the blood was high. The ratio between the potassium content of the cerebrospinal fluid and that of the blood was slightly increased.

#### COMMENT AND SUMMARY

The case records indicate that these biochemical studies were carried out on patients belonging to the parergasic, or schizophrenic, group. Moreover, the brief reports of the cases together with the laboratory findings furnish data which can be better used for comparative studies.

Perusal of the material seems to show the following facts:

1. As far as could be established in tracing the beginning of serious disorders before hospitalization, the duration of the psychoses ranged between three months and fifteen years. In ten cases the duration was from three months to about one year (cases 1, 2, 8, 9, 10, 12, 13, 14, 15 and 20); in six cases, from four to ten years (cases 4, 5, 7, 16, 17 and 19); in two cases, two years each (cases 3 and 6), and in two cases, fifteen years each (cases 11 and 18).

2. The main clinical facts in the series of twenty cases show the presence of manifold parergasic reactions, with delusions of persecution and habit deterioration standing out conspicuously as to frequency.

3. In only three of the twenty patients were values for all the nineteen constituents determined for both blood and cerebrospinal fluid within normal limits. In each of the remaining seventeen patients, one or another component proved to be abnormal either in the blood or in the cerebrospinal fluid or in both. With regard to frequency, the abnormal findings group themselves as follows: potassium content increased in eight cases (cases 8, 9, 10, 12, 17, 18, 19 and 20); lactic acid content increased in seven (8, 9, 11, 12, 13, 17 and 20); cholesterol

content of the cerebrospinal fluid increased in seven (cases 5, 6, 9, 11, 14, 15 and 16); globulin content increased in the blood in four (cases 11, 12, 15 and 20); value for amino-acid nitrogen increased in four (cases 6, 12, 13 and 16); calcium content decreased in the cerebrospinal fluid in three (cases 6, 7 and 16); values for total protein and globulin increased in the cerebrospinal fluid in two (cases 4 and 5), and values for total protein and albumin increased in the cerebrospinal fluid in two (cases 9 and 15). The value for free cholesterol in the blood was low as compared with that for total blood cholesterol in two cases (cases 6 and 13). The uric acid content of the blood was decreased in case 4.

In evaluating the figures for potassium in the blood and for lactic acid in both the blood and the cerebrospinal fluid, I was mindful of the fact that the normal figures<sup>18</sup> fluctuate within wide limits. My figures are beyond the normal range.

4. The wide distribution of the abnormal chemical variations in these cases and the relatively small number of cases would render inadequate any comparative evaluation of the clinical and laboratory findings. The interesting point coming out of this study, however, is that of the twenty patients with a parergasic type of reaction, seventeen showed deviation from the accepted normal limits for one or another constituent, either in the blood or in the cerebrospinal fluid or in both.

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18. Wortis, S. B., and Marsh, F.: Lactic Acid Content of the Blood and of the Cerebrospinal Fluid, *Arch. Neurol. & Psychiat.* **35**:717 (April) 1936.

## PERSONALITY FEATURES AND REACTIONS OF SUBJECTS WITH MIGRAINE

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The psychobiologic aspects of the many-sided problem of migraine have until recently received little attention. Ulrich's<sup>1</sup> subjects with migraine reported attacks after an exciting play at the theater, after card playing, after dancing and (many housewives) after a "large washday." Also mentioned were sick headaches that came with riding on trains and sustained noises and on hot summer days. The first day at school and the arithmetic hour were exciting factors among the young subjects. Headache associated with an unattractive variety of work and relieved by giving up such work also was noted by Ulrich.

Hilda Weber<sup>2</sup> noted that attacks resulted from emotion of a distressing nature or followed anything which wounded the vanity. She also inferred that in some patients migraine was associated with strong feelings of repressed guilt arising from hostile sentiments entertained toward persons with whom they were in close affective relations. Weber's patient showed also contrasting elements of character, namely, humility and submission alternating with intense hostility when aroused by opposition. Love of power, repeatedly expressed in the phrase "I like to get my own way," was thought to be one of the ruling forces in the life of her patient. This subject was sexually frigid.

Tourraine and Draper<sup>3</sup> observed an attitude of detachment or partial self-absorption in their subjects, also deliberate judgment, exaggerated sense of personal insecurity and difficulty in establishing easy social contacts. "Perfectionism" and extreme sensitiveness to criticism were often associated. Anxiety and the anticipation of catastrophe also were noted. It was the authors' opinion that the chosen mate was usually of the passive type, frequently an old acquaintance, and that marriage was commonly a matter of expediency.

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1. Ulrich, Martha: Beiträge zur Aetiologie und klinischen Stellung der Migräne, *Monatschr. f. Psychiat. u. Neurol. (supp.)* **81**:134, 1931.

2. Weber, Hilda: The Psychological Factor in Migraine, *Brit. J. M. Psychol.* **12**:151, 1932.

3. Tourraine, Grace A., and Draper, George: The Migrainous Patient: A Constitutional Study, *J. Nerv. & Ment. Dis.* **80**:1, 1934.

Olga Knopf<sup>4</sup> noted that two thirds of her subjects could be characterized in childhood as "goody-goody" or self-righteous. Sensitivity, shyness, anxiety, timidity, ambition, jealousy and strong temper were often found. About one half of Knopf's married patients reported unsatisfactory marital relations. She observed that some of her women patients had been improperly prepared for the sexual rôle, whereas others had acquired information about sex at a relatively late date. In her series all the men apparently achieved heterosexual relations which appeared adequate.

#### MATERIAL AND METHOD

Awareness of the potential importance of the psychobiologic aspects has prompted the study of the personality functions of forty-six subjects with migraine. These functions were systematically investigated, although no free association or far-reaching analysis was undertaken. Among the subjects in this group certain features were found to occur with striking frequency. Many degrees of the same personality quality were encountered, and no subject demonstrated every one of the characteristics to be described. Because the number of subjects is small, no attempt at statistical evaluation has been made, and the data have been arranged in terms of single instances and group approximations. It is hoped that these notes may serve for orientation and may suggest a practical basis for therapeusis.

In anticipation of the question as to the relative significance to migraine of the personality functions, the following formulation is presented: The subjects studied presented common personality features which are in no sense pathognomonic of migraine, nor are they associated with migraine alone. However, these personality features in certain life situations are especially prone to call forth pernicious emotional reactions. In subjects predisposed to migraine such reactions may precipitate attacks of migraine; hence the personality functions of these persons become important.

These subjects gave detailed descriptions of their attacks and were familiar with the march of symptoms which were personally characteristic. They had periodic pains in the head, usually unilateral in onset but commonly becoming generalized. The headaches were associated with nausea and sometimes with vomiting, constipation and diarrhea. Not infrequently the attacks were ushered in by scotomas, hemianopia, unilateral paresthesia and speech disorders. Other bodily accompaniments were sensations of abdominal distention, cold, cyanosed extremities, tremors, pallor, dryness of the mouth and excessive sweating, even though there was a feeling of being chilled. The attacks lasted from a

4. Knopf, Olga: Preliminary Report on Personality Studies in Thirty Migraine Patients, *J. Nerv. & Ment. Dis.* **82**:270, 1935.



few hours to several days. After an attack most patients experienced a period of special buoyancy and well-being. At such times talkativeness, witty conversation, quick perception and more than even the usual drive were common. In the interval between attacks of migraine gastrointestinal disturbances, notably constipation, occurred in about half the patients. Diarrhea was less frequent. In most instances the attacks of migraine had recurred since childhood or adolescence, with variable intensity and frequency. No social, intellectual, economic or age group dominated, although all but one of the patients was under 50. In this series there were twenty-five women and twenty-one men. Usually the subjects had forebears with similar syndromes.

#### OUTSTANDING PERSONALITY FEATURES AND THEIR DEVELOPMENT; CHILDHOOD ADJUSTMENTS

The accounts of the childhood of these persons revealed that more than half were "delicate" (or treated as such), shy and withdrawn and usually were extremely obedient to the desires of their parents. They were commonly sober, polite, well mannered children who did their school work conscientiously. This docility was often contrasted in the same person, however, with an unusual stubbornness or inflexibility provoked by particular situations. Moreover, several of the children were obstinate, argumentative and disobedient, and a few were actually sullen and hostile. These apparently contrasting qualities of character were often a prominent feature of the child's personality. Courteous, gracious, polite and accommodating behavior was associated in the same person with obstinacy, open defiance or even rebellion. Sensitiveness was associated in the main with restrained, "proper" social relations, but it was on occasion expressed in frank pugnacity and defensive "chip on the shoulder" deportment. Temper tantrums occasionally resulted when these children were frustrated or pushed. Though most of them were not pugnacious, one child was unusually militant, taking offense at fancied slights and insults and precipitating fights and quarrels. Most of them did not participate in adolescent "hoodlumism."

Although parents and teachers found it difficult to change the pace and manner of conduct of these sensitive children, they found them trustworthy and energetic and, on the whole, respected and admired them. Consequently these children were given responsibilities at an early age. Also, they were given special privileges by adults and were considered unusually thoughtful and responsive to the wishes and needs of their elders.

Exceptional attachment to the mother was sometimes, but not universally, noted. Commonly this relationship was nothing deeper than

that expressed by one mother as "John seems closer to me than do the other children," although in two instances pathologic accentuation of this relationship occurred.

The children took good or even excessive care of their toys, protecting them from destruction and from other children. Some found it difficult to part with toys of the past. They were careful of their clothes, and their lockers were usually in order. They were generally neat and clean, obediently carrying out such simple hygienic dicta as washing their hands. One migrainous woman said, "I was extremely careful with my toys; in fact, I have most of my dolls from my childhood at home. Also, I was very neat with my clothes. My mother used to say that I stayed clean all day."

The following case notes illustrate some of these features:

A migrainous subject aged 30 was considered by his mother to have been the most obedient of her three children. However, in referring to his childhood he said: "If my mother told me to be there or do something, I would do it, but when I went to school I paid no attention to the teacher. My clothes and hair were just right. My necktie had to be just right and my scarf pin in the correct place. My trousers had to be of the proper size and length, and I was always polishing shoes. I was extremely shy, and it was painful for me to see visitors. I blushed intensely on the slightest provocation. I took my time about such things as washing, getting dressed and bathing. Getting dressed was a particularly slow business. I was the last one to appear at table at every meal because of my handwashing activities. My mother told me it was proper to come to table with clean hands. I always did. This was quite opposite to one of my brothers, who always had dirty hands. In fact, he purposely came to the table with dirty hands in order to irritate me. I was nicknamed "Slow Poke." However, I think my behavior got me a great deal with my parents. I was distinctly the favorite child of my father. It seemed to me that I was always attempting to keep harmony in the family and to be liked by my parents because of my obedience. In fact, to be disliked by any one was extremely unpleasant, no matter how little I thought of him. Until I was about 15, I used to draw almost continually. I went directly home from school to draw and would copy pictures as late at night as I was permitted. I used to select objects to copy that had in them a great deal of detail. I once chose to copy a picture of a battleship and with a hard, sharp lead pencil tried to put into this picture of a boat every detail I could see."

As already mentioned, this child (aged 7 to 10) was indifferent to the tasks imposed by his teacher and spent as much of the day as he could drawing pictures on his copy papers and books. As a result he had to repeat his classes. At the age of 10 there was a sudden turn about in his relation to his school work. From that time his achievements were adequate, and he quickly caught up with his group. He began to receive more responsibilities, such as depositing money in the bank for a school fund and playing the piano at the school assembly.

During adolescence and later these children were even more than usually preoccupied with moralistic and ethical problems, particularly concerning sex. In their relations with their fellows they were likely to be disappointed that others did not share their moralistic preoccupation.

OUTSTANDING PERSONALITY FEATURES AND THEIR DEVELOPMENT;  
ADULT ADJUSTMENTS

*Ambition and Success.*—In adults the qualities of character described took more definite form and were sometimes even accentuated to an exceptional degree. Nine tenths of the migrainous subjects were unusually ambitious and preoccupied with achievement and success. Almost all attempted to dominate their environments—the less successful merely by the force of their demands and the tyranny of their moods and the more successful through the acquisition of power, money and distinction. With perhaps two exceptions they were conscientious, “perfectionistic,” persistent and exacting, attempting to arrange or bring order wherever possible. They were meticulous, the surroundings in which they placed themselves reflecting their neatness and fastidiousness, yet most of them were efficient.

On the whole they were a well dressed group, including those in the most distressing financial circumstances. Their clothes were rarely “fashionable” or conspicuous, but were conservative, with neatness rather than attractiveness as the prevailing effect. Among the men polished shoes, pressed trousers and neatly arranged neckwear and hair were conspicuous. The women sometimes even sacrificed a degree of attractiveness for austerity or severe neatness.

*Perfectionism and Efficiency.*—These subjects usually made a feature of their “perfectionism” and efficiency and gained through this quality much praise and personal satisfaction. Because of and through these qualities many responsibilities descended on them, which they gladly accepted. About a fourth of them, owing to their characteristic qualities, had been made secretaries again and again of the various social or professional organizations of which they were members. In general these men and women were extremely hard working and were endowed with a great deal of energy, “push” and striving. According to their friends they seemed to be tireless in pursuing their goals. In intellectual and creative work this revealed itself through endless effort to attain the perfect result or flawless data; in others, less sophisticated, in the attitude that “everything must be just so.” Thus, one housewife called herself a “Dutch cleanser,” and her husband jokingly referred to her as a “fanatic with a dust brush,” suggestively remarking, “If you would throw away that mop you would probably feel better.” A migrainous hair dresser expressed it: “If I give a wave and it doesn’t come out just right, it annoys me frightfully.” Several subjects said, “I take things too hard.”

Despite their efficiency they often allocated responsibility poorly, “fussing,” worrying and following up their instructions or directions to see that they were properly carried out, commonly preferring to do tasks

themselves rather than to assume the risk of allowing others to do them. In one instance this was expressed as, "I feel as though no one can do things as well as I do them"; in another, "If I tell the housemaid to do something, I like to follow her up to see that it is properly done," and, again, "I fuss and bother and worry about matters that I have turned over to some one else." These qualities were illustrated further in an able and ambitious research worker who, in addition to her full time laboratory pursuit, conducted a home for herself and her husband. She said: "I had a maid once a week to clean house, but I couldn't let her wash the dishes. It irritated me too much to watch her. She would not change the water several times, as I instructed her to do, and I felt that the dishes were not clean. When I wash dishes I change the water and rinse each dish thoroughly until I know it's clean."

The intensity with which these subjects attacked their work, their determination to "see a thing through" and their tireless persistence made interruptions extremely distressing. They often found it difficult to stop until a task was completed. This commonly meant long, irregular hours or periods of intense application. Despite apparent success, several subjects harassed themselves with the conviction that they had not done enough with their lives and opportunities and that at their age they should be further advanced.

The quality of "perfectionism" compatible with certain types of productive effort was often carried over into departments of life in which it was not only unnecessary but wasteful and sometimes even annoying to the subject. One subject, for example, whose attitude toward his work enabled him to count successfully myriads of microscopic biologic forms, was distressed because in sending a letter he felt impelled to place the postage stamp an exact number of millimeters from each edge of the envelop.

*Orderliness.*—The love of order, lists, headings, titles, subtitles and card index systems was prevalent among these persons. Several treasured stamp collections which were elaborately classified. In addition to his stamp collection, which was meticulously arranged, one migrainous medical student, six nights in the week, typed the lecture notes of each day. This he had done for seven school years. At the end of each course these edited notes were bound and placed on a shelf with other similar volumes to be turned to with pride and satisfaction.

In the contributions of the migrainous scientists, arrangement, classification, enumeration, statistical manipulation and detailed analysis played the major part. Theoretical considerations other than those that flowed directly from a mass of exact data were rare, and the free expression of scientific fantasy in philosophic correlation was not noted.

Several migrainous subjects who had orderly habits of work were indifferent about their personal appearance and households. Their preoccupation with orderliness and arrangement did not always extend over all departments of life. Apparently, if their major concern had become one of ambition, centered primarily on distinction, money or power, they were less meticulous or even indifferent about their homes and dress.

In creative and esthetic effort the love of formalism and nicety of detail also were commonly shown. Most cultivated persons were fond of contrapuntal music and were particularly partial to Bach, Hayden and Mozart. They were unsympathetic to less formal and more voluptuous expression. In the plastic arts, notably painting, lithography and etching, the same enthusiasm for the formal or architectural was observed.

*Doubts and Repetitions.*—Repetitions and persistence in many instances appeared to fill the needs of special character traits and therefore afforded satisfaction. That is to say, in some subjects pleasure resulted from these perfectionistic activities, perhaps in the same sense that a child secures pleasure from repeating some act again and again. Occasionally, however, repetitions gave less satisfaction and, in a few, actual dissatisfaction and boredom. The fear of being found wrong or open to criticism was given by several in explanation of apparently unnecessary reviewing and repetition of some act of responsibility. Possibly also correlated with the fear of being found wrong was the difficulty in making a decision. Procrastination, delay and avoidance in taking a stand or making a judgment occasionally were outstanding. Usually, as already mentioned, the orderly or repetitious behavior was socially acceptable as an expression of extreme cleanliness, neatness or carefulness.

Two subjects had bedtime rituals of arranging bath towel, tooth brush, razor and soap in anticipation of the morning's ablutions. In one instance, however, these tendencies bordered on the frankly pathologic. The subject, a successful business man, performed many acts in threes—combing his hair three times in the morning, tying his tie three times and, when pointing out something in his account book, turning over the given page three times. He also had rituals which he carried out before retiring, such as arranging his clothes in a special way at the bedside and drumming on the floor with his feet before finally putting out the bedside lamp.

Apparently in contrast with the love of orderliness was the appearance of the cupboards and drawers of some of these subjects. Externally, in the household or office, there were order and cleanliness, whereas the closed containers mentioned were in disarray and were stuffed with odds and ends and fragments. Such persons complained



that they found it difficult to throw things away for fear that some time they might find a use for them. Consequently notes, comments, pieces of apparatus, bills, receipts and pieces of cloth accumulated. Thus, a meticulous housewife, who stated that orderly surroundings were essential to her peace of mind and who was distressed by the fact that her bureau drawers were never in good order, said: "I have them all in order, but they don't stay that way very long. Half the stuff that's in the drawers is no good. I hate throwing things away; in fact, I never throw anything away, because I think I might use it sometime; consequently when I look for something the drawer becomes disorderly."

*Inflexibility.*—These subjects became out of patience with persons who presented qualities of character opposite to their own. Life situations demanding contact with disorderly or hurried deportment distressed them. Two sufferers who found themselves engulfed in such situations actually ran away.

The attitude of these subjects toward qualities in others similar to their own was further evidence of apparently contrasting elements of character. Thus, although tireless and possessed of endless patience in pursuance of their own tasks, they were often impatient with such painstaking, time-consuming effort and seeming lack of prompt response in others. Also, although themselves the creators and elaborators of schemes, systems, plans and arrangements, they frequently had great difficulty in complying with, or adapting themselves to, systems imposed on them by others. This quality was accompanied with degrees of resistance to change variously expressed as inflexibility, inelasticity, "nonpushability," strongheadedness and stubbornness. Because of these qualities, readjustment and compromise were difficult; and many, rather than undergo modifications, preferred to sustain loss or defeat. In several instances business associates and spouses found it possible to modify the course of these subjects by making it appear to these persons that the proposed changes had actually originated with them.

*Resentments.*—About two thirds of the subjects harbored strong resentments, a quality which seemed to be linked with inelasticity. They found it difficult to forgive or to accept the foibles of their fellows. In several this was associated with the desire to be "well thought of," that is, rather than "talk through" or overtly express resentment against a fellow human, they remained ostensibly friendly, nevertheless harboring deep feelings of resentment against those who injured them. This reaction of resentment and inability to forgive was often turned on the subject himself, so that personal deviations from set standards resulted in devastating self-accusation and flagellation.

*Attitude Toward Bodily Inadequacy.*—The attitude of most of the subjects toward the headaches was strikingly similar. In the intervals between attacks they blatantly disregarded loss of sleep and common sense limits of work in pursuit of their goals. They were outspoken and stoical in waiving reasonable restrictions. Furthermore, they were often unduly sensitive at such times even to being reminded of their headaches. Yet, on the other hand, with the onset of an attack many of these same subjects enthusiastically welcomed inquiry about their health and often dominated their environment and tyrannized over their families with their distress and needs. As a result of these bodily disturbances these already anxious subjects experimented with dietary regimens, particularly in the elimination of certain foods. These restrictions were either prescribed by physicians or elaborated by themselves.

The subject's attitude toward the attacks appeared to be part of his attitude toward his body in general; that is, these people usually had a disregard for the body as long as it functioned well, but they reacted with resentment when the body interfered with the attainment of their ends. This appeared to be a further expression of an unwillingness on the part of the subject to adapt himself in this case to the limitations of his organism. Thus, there followed a resentment genetically similar to that previously mentioned, namely, a resentment against the definiteness of personal and environmental requirements.

*Caution and Economy.*—By no means miserly or penurious, these subjects made every effort to obtain the most for their money and were fully aware of the disposition of their means. Getting a good bargain, often at great sacrifice of time and energy, afforded great satisfaction. Waste or extravagance was revolting, and they were averse to gambling or rash investment. Orderly bookkeeping and budgeting were characteristic. Cautious spending was associated with the purchase of goods of full and lasting value. Ephemeral or transient returns were less commonly sought. Extravagance, however, was notable in one woman, who bought expensive gifts for her mother. In fact, there was sometimes noted, side by side with the meticulous accounting for each penny, extreme generosity and beneficence as regards larger sums. Also, money was desired as a means to power. Another apparent contradiction resulted from the conflict between cautious spending and the strong impulse to "have a thing right away." This strong desire overcame the caution of one person and led her to buy on the instalment plan.

More than two thirds of the subjects were much interested in time. The desire to "get the most" for their money and the concern about time, namely, the desire to get as much done as possible in a given time, were linked. There was concern about being on time, doing several things at the same time and the use of spare time. Thus: "When

I have free time I like to have something in my fingers, something to do." Impatience was characteristic, and efficiency was held at a premium. Thus: "I get crazy when I can't get action"; or again, "I am bothered by the fact that things do not move faster than they do." To "get behind" with work produced great distress in several. In one instance the time problem was expressed as, "I get irritable when I have to wait for things; I like everybody on time. If I make an appointment I expect people to be there." Another subject said: "Time is my worst enemy. It seems to me that I am always working against it, not because my thoughts and movements are slow, but because they are directed toward a perfect result which not only must be accurate when approximations would be adequate but also must be neatly recorded. A letter to a friend or the framing of a picture receives as much respect as my occupational pursuit, although less important tasks are seldom undertaken because of lack of time."

*Social Relations.*—The social relations of these migrainous persons were usually of a cautious, circumscribed nature, permitting intercourse only on impersonal subjects. Almost without exception they cultivated a courteous, gracious manner which further enabled them to conduct their social relations at arm's length and likewise protected them from intimacy that might engender friendly criticism. As a result, many of them gave the impression of being cold, aloof, politic and detached, despite an astutely developed charm and *savoir faire* and a frankly demonstrated desire to be thought well of. Realizing the importance of proper social form to his peace of mind and advancement, one hard-working, ambitious migrainous musician assiduously read and familiarized himself with the contents of a manual of etiquette. Some developed as a social device a gay, light, flowing humor and coupled this with a type of buffoonery in which they played the clown. Furthermore, these persons seldom allowed themselves to be in a position which might provoke criticism. Although they were often extremely critical themselves and ostensibly encouraged frank social or professional relations, they reacted with resentment to any criticism directed at their own formulations. They were slow to seek advice or alter their course in the face of even valued opinion. One subject included in his social world only those who would outspokenly approve of his creative effort. The free expression of enthusiasm or deep affection was curtailed. However, occasionally there was revealed in some unexposed, private department of the patient's life perhaps an even extravagant display of sentiment or warmth.

Awareness of their own assets and their satisfaction in being "right" many times gave the impression that these persons were without essential humility toward their problems. A self-righteous attitude or an unwillingness to give credit to the ability of others also was seen in such expres-

sions as, "I feel as though no one can do this as well as I can"; or again, "What I do is perfect; what somebody else does is not good enough." An extremely successful manufacturer said: "I work with my men and work harder than they do. I was brought up in a school where the foreman sets an example of how the work should be done." Another variation of their high personal appraisal was reflected in the statement, "I'm not the kind who goes out to dance or do things like that; I don't drink, I don't smoke, I go to bed early"; or again, "I haven't met many people who can measure up to my standards."

Throughout their relations with people or institutions these persons were inherently cautious and conservative. They were opposed to elements in the community that represented change from the existing or supposedly orderly way of life. They sometimes nominally affiliated themselves with rebellious factions, but this was usually because they believed the existing policies disorderly. Expediency as an administrative policy they found distressing.

*Sexual Adjustments.*—The sex and marital situation appeared to be an expression of the inability of these persons to adapt themselves. "Setness" and resentment that the marriage partner could not be forced into attitudes, manners and customs or that life situations would not bend to arbitrary standards was an important element of the difficulties in the sex relations.

In this small series, sexual dissatisfaction existed in more than four fifths of the women. There were inadequate preparation for menstruation and for the sexual rôle and overreaction to the discomfort associated with each menstrual period. Courtship and marital relations were made difficult by the somewhat arbitrary and inelastic notions concerning sex. Sexual contact was as infrequent as once a month and in one instance only once in two months. Orgasm was seldom attained, and the sex act was accepted as, at best, a reasonable marital duty. In several instances it was deemed frankly unpleasant and was resented. Notwithstanding, such persons expressed devotion to their mates and maintained ostensibly satisfactory domestic relations. One widow's attitude toward the marital problem was revealed by her consideration of another marriage of convenience, although she had made one that was quite distasteful. She stated: "I have no sex desire, but I would get married again for convenience or companionship. I have a young man now, and I am considering it. However, I'm not so sure, so I keep putting it off. At first during my marriage I was more ashamed than anything. Now I have less guilt and shame, but I am not enthusiastic about it."

Among the men, sexual activity in regard to the nature and frequency of copulation was apparently adequate. Sometimes, however, as an

accompaniment of ambition and hard application to work, the sex drive was less insistent and the contacts were more widely spaced. Fixity of standards and lack of compromise introduced another element into sex relations.

Incomplete sexual adjustment in more than a third was revealed in those sexual responses not involving intercourse. In these men, despite efforts to dominate and insistence on full subordination, really excessive dependence was found. This was shown especially in three instances in which insistence on attention and "fussing over" was greatly exaggerated when they were indisposed or having a headache. The wives felt as though they had another dependent child, whereas the husbands maintained their dominance by insisting that they receive at least as much attention as the junior members of the family.

It is doubtful whether any underlying structural or physiologic defect was responsible for the dissatisfaction with sexual experience. This was particularly so since in all the men orgasm was successfully achieved. The failure on the part of the women seemed to be linked with the general personality problem and inflexible standards, and also with the inability to "let themselves go." More plasticity in all relationships is perhaps expected of women, and consequently the same character qualities of rigidity, or "not letting go," seemed to create even greater difficulties for the women than for the men.

The fear of pregnancy, sometimes expressed, was shown on investigation to have a similar basis. There was an unwillingness to lose body form, to be forced to retire from social and industrial life and to meet the limitations imposed by caring for a child; in other words, the person was reluctant to accept and adjust herself to the consequences of maternity, rather than fearful of the risks to life involved in pregnancy and delivery.

*Relations to Parents.*—Excessive dependence of the migrainous subject on the mother or a marked attachment to her was apparent in over a third of these persons.

The separation of the parents of one subject when he was 15 made him assume full responsibility for his mother after that time. By arising at 3 a. m. and delivering bread, tending furnaces, running errands, delivering newspapers and again delivering bread at 3 p. m., this child maintained the home. Somewhat later, by means of semiprofessional baseball, his income was augmented. At the age of 28 he attempted marriage. At this time the mother, in response to her son's inquiry as to what gift she would most appreciate for her birthday, replied, "Give up that girl." This he did. Some time later, despite his mother's protests, he married a passive, undemonstrative woman. The marriage was not successful. He made unusual demands for attention and was irritable about his wife's use of money and her care of the house. She, on the other hand, obtained no satisfaction from sexual relations with her husband and avoided the sex act whenever possible.



His own sexual experiences consequently afforded him no gratification, and he subsequently became jealous and feared that his wife's indifference was based on her devotion to some one else.

An instance of an unusual relation with the mother was seen in a migrainous patient aged 42 who had had headaches since childhood. He slept in the same room with his mother until he was 21 years of age. He married at the age of 30 without the approval of his mother, who had selected several girls whom he had refused. His married life was moderately successful, his wife being a passive, plastic woman who treated him much like a son. Although the mother had died ten years previously, he still had frequent and vivid dreams of a pleasant nature about her and was uncommonly distressed on awakening to find she was not there.

The following case notes again illustrate the mother-daughter relationship and include as well other psychobiologic features, notably anxiety and outbursts of rage.

A married woman aged 33 had migraine, of six years' duration, which had been growing worse in the last six months, attacks occurring once or twice a week. The illness had its onset with growing domestic tension, culminated by her husband's sister coming to live in her home. The sister quarreled continuously with both the patient and the patient's husband. The latter had been unemployed for four years. The family was on relief, and the patient, besides keeping house and caring for two children, supplemented the family income by peddling stockings. She was a meticulous, "fussy" housekeeper. "When I am home I don't sit down for five minutes. I always find something to do. I've got a worrisome nature; and besides, having a man around the house seven days a week, you can't keep your house 'just so.'"

The patient was a tense, anxious, driving and ambitious woman who was thoroughly dissatisfied with her lot and looked on her life as miserably lacking. She considered herself successful with people and said: "I was always quiet and refined, and I knew my place. I am loved by everybody. Nobody knows that when I am alone I cry and worry. Every one thinks of me as being cheerful and carefree." She was cautious with money and used it well. "I have full control of the money in the household and am economical. I count every penny before I spend it." Despite an unusually small income, she gave her children advantages that could come only from good management. Notwithstanding concern for her family's welfare, her relations with her eldest daughter were bad. The child had temper tantrums and was obstinate and seriously distressed her mother. On one occasion the child precipitated in the mother a frenzy of murderous rage. "I wished she were dead. I started to undress her. I wanted to murder her. I wanted to see her dead nude. It ended by my having an hysterical crying attack."

The patient had been the youngest of seven children and had been considered a timid, bashful, obedient child. "There was never a question of being forced or told to do things. I was always a fussy person—wanted things done just right. I was liked in school by the teachers, but I did have temper tantrums, and I cry a lot even now." She was given no information concerning menstruation, and with its onset she fearfully informed her mother, who then slapped the child's face vigorously. The bewildered and outraged child resented this supposed punishment bitterly and had a temper tantrum, crying out, "What did I do to deserve it?" The mother did her best to pacify the daughter and explained that slapping the cheeks was an ancient custom to keep the color in the face of the menstruating girl.

At the age of 11 she had many responsibilities loaded on her, primarily the care of her sister's babies. This, and the oppressive influence of a dominating father, caused her to resent her home life bitterly. She ultimately succeeded in going to business school and also took piano lessons; she learned to play moderately well. "I am very ambitious. I wanted a career as a piano player. I used to give piano lessons, but I was no success at it. I was deathly tired of my home. I was tired of 'hand-me-downs' all the time. My whole trouble was I wanted more than I had in life. It made me resentful and nasty." Consequently she grasped the first opportunity for marriage, explaining, "I married my husband just to get away from home." Her sexual and married life were unsatisfactory. She explained: "I've had some sexual pleasure, but I never longed for it or desired it of my own free will. I feel as if I had to give in to my husband now and then. I have too much on my mind to enjoy such things." Despite unhappiness when she had been at home, she was intensely devoted to her mother and dependent on her. "When I lost my mother (one year ago) I thought that was the end of everything. We were inseparable. There was something between us I cannot describe. After she passed away I thought I would go insane. I cried and had hysterical fits. My husband said, 'Why can't you love me as you love your mother?' I never could love anybody again as I loved her."

In a similar instance, a patient who had had migraine for fifteen years lost it promptly on the death of her mother, although she had not lived with her for some years. One patient after marriage became increasingly anxious about her mother's health. This was associated with the realization that her marriage was a failure. She broke up her household in the suburbs to live on the same city street with her mother so that she could see her daily.

The excessive dependence of child on parent among these subjects seemed to be an expression of poor emancipation and incomplete development of self-reliance on the part of the offspring.

#### SPECIFIC EMOTIONAL REACTIONS

From the foregoing detailed studies of cases it is clearly demonstrable that more than nine tenths of the subjects had "set" personalities, with "perfectionism" and a desire to have things "just so" as outstanding characteristics. This basic inelasticity was often covered by a smooth surface of poise and social grace. They gravitated naturally into positions of responsibility but found it difficult to modify their standards and to adjust themselves to the variable and uncertain factors of their life situations. In reaction to experience that other human beings and environmental conditions were not "just so," pernicious emotional reactions were developed and sustained, chiefly tension,<sup>5</sup> dissatisfaction and resentment. The severity of the reactions depended on the degree of the subject's inflexibility and the demands of the environment.

The manifestations of tension, such as restlessness, adventitious movements or tics, were common but by no means universal. Many of the subjects "looked alert" and "at attention," expressed by one patient

5. The word tension as used here implies that the person appeared to be and felt as though he were under pressure, "crowded," "pushed" and "driven."

as "I'm always on the go, I want to do this, I want to do that." There was sometimes noted, particularly in men, the quality of studied poise, most often accompanied with a tense facial expression with furrowed forehead, contraction between the eyebrows, quick moving eyes and perhaps uneasy laughter. One such person referred to himself as "temperamental and apt to fly off the handle," and another said, "When things don't go smoothly, I go right up in the air." One woman referred to herself as a "spitfire—I flare up and boil over." Yet superficially these men and women might be regarded as well poised. One subject's handwriting during periods of extreme tension became unreadable; one became overtalkative; another spoke more rapidly and articulated poorly. In some, quick and excessive movements were observed, while others acted as though they suffered from ennui or boredom; still others seemed to be completely relaxed, except when alone or at work. High speed automobile driving was a manifestation in several cases; heavy smoking and coffee drinking, in others.

Genuine relaxation was seldom attained, and only a few subjects achieved resting points of satisfaction in their work. The intensity of drive noted in these persons suggested that they did not enjoy the actual "doing" and that the goal was the important source of their satisfaction. Accomplishment seldom brought more than the most transient pause, one task quickly following the next until the attack of migraine interrupted the procession of activity for hours or days. After such a period of enforced rest and detachment from responsibility and work, these persons returned to their labors with renewed vigor.

Although tension was a common emotional state in all, other reactions also occurred. Chief among these were anxiety, anticipation and uneasiness, expressed by one subject as, "I feel as though I were always in the shadow of the ax." Almost as common were frustration and resentment. Fear, anger and rage were only occasionally dominant reactions. Tension and the sense of guilt were created in one migrainous subject by the fact that she had no children. She had become pregnant soon after marriage and had had an abortion performed. "Perhaps God punished me, and for that reason I cannot become pregnant again." However, this was not the only cause of stress, since her married life was unpleasant, with limited and unsatisfactory sexual relations and many quarrels. To what extent tension was the effect of the various emotions described or in itself a pure reaction could not be determined and is not relevant to the present discussion.

There was variety not only in the types of emotional reactions but also in their intensity and duration. As already indicated, sustained emotional states of anticipation, anxiety, resentment and tension were common. Of particularly long duration were anxiety and tension. The

depth of the emotional responses was not profound, save in a few instances. Most common was a long-sustained and superficial, pervasive uneasiness or anticipation of untoward events which periodically merged into a slightly deeper reaction of anxiety with tension. Less common, but sometimes important, were short-lived, intensely moving reactions of rage. In fact, the most intense emotional responses were those of resentment and rage, which, when prolonged, as only occasionally happened, were associated with revenge and spiteful reactions. Most of the subjects in this group had failed to correlate their attacks of migraine with life situations or their reactions to the latter. However, many recognized the existence of their tension states, although more than half expressed no dissatisfaction with them and a few even obtained pleasure from the feeling that they were "alert" and "striving."

#### CIRCUMSTANCES PRECIPITATING MIGRAINE

With these considerations in mind, an attempt was made to determine to what extent certain life situations in these particular patients might be related to the frequency and intensity of attacks of migraine. Long-sustained states of tension were periodically punctuated by headache brought on by no known or special incident; far more commonly, however, it was observed that under these same circumstances situations which provoked sudden changes in mood, such as excitement, anticipation, joy, anger, resentment, disappointment, surprise, horror or an unusually severe or prolonged effort, were followed by characteristic attacks. It is of interest that an attack sometimes lent a temporary respite from further episodes, even though the subject continued to be exposed to the same noxious situation.

*Ambition, Frustration and Work.*—Ambition and striving made work extremely important in the life pattern of these subjects, and frustration in work was particularly hard to bear. To be away from the workbench deprived them of the satisfaction of achievement, so that vacations were often periods of headache.

One subject, because of severe headaches which often were associated with a period of intense application and prolonged hours of work, was, through the generosity of his employer, assigned after a short holiday a task which required little effort. At first, because of the light work, he cleaned and tidied his shop from floor to ceiling. Despite this, he was obliged to spend a portion of the day waiting for the next task. As a result, this tense, driving craftsman became extremely bored and therewith came more headaches.

The anxiety and tension associated with interruption in work appeared to be connected in some subjects with headaches on Sundays and holidays.

The Sunday headache in one subject was preceded by annoyance at the emptiness or lack of anticipation in the day. This made the prospect of the ensuing twelve hours drab and colorless. Another woman said her anxiety about achievement, which ordinarily had its outlet in work, was frustrated and blocked on Sundays because she felt that she should rest. After days of carefully utilized time and effective drive, came one day purposely lacking in order, continuity or rewarding avocation. One subject was kept from obtaining as much rest as he needed by the thought that he was "missing something" through inactivity or sleep. In short, realization that time was passing "without anything being accomplished" was a common source of distress among these striving persons.

However, the "Sunday" or "holiday" headache had other components. The "let-down" or release of tension or anxiety also appeared to be a factor. The "let-down" headache was not necessarily associated with boredom, frustration at not being at work or apparent tension. In fact, with some of these migrainous subjects "letting down" became an elaborately developed ritual. This type of headache was noted also on the first day of a vacation, immediately after final examinations and during the first few days "out" on a long sea voyage. Each of these situations was immediately preceded by forced activity and the strain of preparation or packing. In short, any sudden change of program, release from discipline, tension or restraint or sudden slowing down in pace was commonly accompanied with an attack of migraine.

Attacks followed failure but not only failure, since success sometimes precipitated them. Thus, on two occasions, one subject observed that headache came on after the successful conclusion of tedious experiments which she had believed would demonstrate nothing. A distinguished investigator noted that after a prolonged, severe and successful "grind," the time which he allowed himself for relaxation and recreation would often be a period of headache. These attacks were perhaps akin to the aforementioned "let-down" episodes.

The fear of failure to excel precipitated attacks among some persons in this group.

A teacher who had been free from attacks since her college days (a period of some years) had a series of severe and recurring sick headaches while taking special training as a graduate student. Her comment on the correlation was as follows: "I think it is all due to the way I regard school. I cannot be satisfied with anything less than 'A', or else I think I am a failure. It is a matter of personal pride with me. I do not excel in any creative department of life, I do not have any particular intuition about people and I know that I lack social poise. To bolster my ego I have only my ability to learn to fall back on."

The effect of intense competition was seen in three conscientious, hard-working medical students who had their first attacks of migraine during or after important examinations in which they hoped to excel. One of these men never had headaches after he had graduated from medical school. The others continued to have them under similar stress of competition.



Added responsibility sometimes increased the frequency and severity of attacks of migraine. Thus, one conscientious person while an officer in the World War regularly had headaches on occasions when he was made "officer of the day."

For certain subjects, self-imposed "set" standards created periods of distress which were terminated by the recognition of the dilemma.

An able painter had characteristic attacks of migraine in one period of his life when he had elaborated a rigid, formal attitude toward his work, imposing arbitrary standards of performance which were incompatible with experience. Consequently, his artistic productions fell short of these concepts, depriving him of satisfaction and giving, in fact, nothing but disappointment. Repeated attempts to force his efforts into the mold made his work even less satisfactory, causing him more and more frustration, until ultimately he had to give up the work. During this time he had frequent and severe headaches. Later, when in desperation he abandoned his particular system and criteria, his productivity increased and his attacks of migraine markedly diminished in frequency.

The following case notes on a migrainous woman illustrate the onset of headache with frustration in work and after criticism:

A striving, ambitious woman aged 26, whose studies for a doctorate were interrupted for economic reasons, became a technician. She expected to continue with extension courses, but this plan did not meet with the approval of her employer. Her work, primarily investigative, was unusually successful. She was asked to deliver a lecture on the subject matter of her investigation, which she did ably. The privilege of giving a second lecture was not granted by the institute in which she worked, ostensibly because she had no doctorate. Already somewhat frustrated by her inability to continue with her extension work, she now felt that she had reached an impasse, which exaggerated her tension, dissatisfaction and restlessness. She worked unusually hard, and during this period her headaches became more frequent and intense. Sundays and holidays were usually periods of headaches. During this time even minor fluctuations in her life situation caused her to over-react and precipitated attacks of migraine. In one instance headache followed over-reaction to mild criticism. "My mother-in-law teased me about the way I darned my husband's socks. We all had a lot of fun about it, but I boiled inside. She asserted that I just sewed up the holes with big over and over stitches, when in reality I've struggled to have my darning perfect. I match the color of the threads I use to the color of the socks, and if it's made of two colored threads I use the two colors and carefully weave back and forth with the proper thread to get the effect in the darn as near like the fabric as I possibly can. I don't enjoy doing this work because it takes so much of my time, but I am determined that M's socks shall be done right. I put my whole heart in it and that's why I couldn't bear to be criticised, even in fun. I tried not to show that I cared, but my father-in-law remarked, 'You mustn't tease F. or she'll have a headache.' The worst of it is I know that's true, if I'm teased about something I've put a lot of heart and energy into."

*Criticism.*—Criticism was in several instances the precursor of attacks.

A competent physician on one occasion, after painstakingly working over a patient, was vigorously criticized by the family after the patient's death and was actually accused of having poisoned her with medicine he used. Pushed by the desire to be justified for his management of the illness, the physician left no stone unturned until he had succeeded in having an autopsy performed by the medical examiner. In an intensely excited state he successfully culminated his defense against criticism, satisfied himself that his position was beyond question and then notified the husband of the deceased patient of the steps he had taken. In the midst of this telephone conversation he began to have scintillating scotomas, which were followed by a headache. Similarly, a well known artist's attacks were precipitated several times by unfavorable newspaper comment on his work.

In the following instance the anticipation of criticism precipitated an attack of migraine:

A perfectionistic pathologist submitted a much belabored communication to a scientific periodical and eagerly awaited word of its acceptance. Several weeks later he was confronted by an envelop containing his returned and supposedly rejected article. He was deeply humiliated and disappointed. An hour passed before he opened the envelop, and during this period a severe headache developed. The attack was not arrested despite the fact that the envelop contained not only his manuscript but "proof" and a letter of commendation from the editor.

*Resentment.*—The effects of sustained resentment were seen in a boy aged 9 in whom attacks began after an accident.

With considerable perspiration, "choking up" and tension he related memories of the accident, which had occurred three years before. He and a sister started home from a playground, the boy following at a distance, so that he witnessed all that occurred. Just as she stepped from the curb a car struck and mangled her. "My sister was crushed all but her heart, and then when she sat up she bled from the mouth. She lived only ten or fifteen minutes." The patient recalled that he was terrified and ran to inform his mother. He had his first attack of migraine several hours later, and during the following two years attacks often occurred during fantasies in which he reconstructed the accident in his imagination and devised means to be employed in avenging himself on the automobile driver who was the cause of his sister's death.

*Time-Bound Factors.*—Several patients complained that they had "headaches" more at one season of the year than at others.

A school teacher aged 38 had had headaches in the early fall for ten years. The migraine had its onset coincident with the acceptance of a difficult teaching post in a city distant from her New England home. She feared she would not be successful. With her departure from home and the beginning of each school year the headaches recurred. This striving, ambitious woman started off each school year with an extremely crowded program. From 9 a. m. to 3 p. m. she taught groups of fourth grade Italian-American children. She walked to and from her apartment for lunch. In addition she kept her household in meticulous order and prepared her own meals. In the evening she took extension courses and, when not so engaged, exercised vigorously by skating. Moreover, she cultivated many social contacts and attempted to maintain an animated social presence.

One woman's headaches increased in frequency and intensity in the spring. Investigation revealed that the spring season was for her a period of diminished

energy, lasting some weeks. During this period, however, instead of adjusting herself to her decreased ability, she forced herself to maintain the same standards of performance and amount of work as in the fall and winter. This she accomplished at the cost of feeling "tired," tense and driven.

One woman complained that the period from June to October was for her the season of greatest number and severity of attacks of migraine. She had been married for ten years; and although she was a devoted wife her sexual life had been unsatisfactory, since her husband was practically impotent. They had coitus as infrequently as once in eighteen months. She had successfully met this problem through work and had become an influential figure in county welfare activities. From October to June she was completely engaged in the social and political affairs of the community. In this period her headaches were infrequent, occurring about once in two months; but in June the demands of work declined, and she became more aware of sexual tension. She dreaded the approach of summer and with its onset became intensely bored. Thereafter, the headaches increased to twice a week and were more severe.

The "Monday" attack of migraine is another instance of a time-bound reaction.

For fifteen years an electrical engineer aged 56 would have headaches and nausea beginning at about 3 p. m. on Monday. They continued throughout the rest of the day, and on Tuesday morning he still felt uncomfortable and slightly listless. Saturdays and Sundays he spent at his suburban home occupied with gardening and, for the most part, outdoor activities. He had observed that on Mondays and Tuesdays his effectiveness and efficiency were the lowest for the week and that he reached his optimum state on Thursdays and Fridays. This set, perfectionistic man drove himself to perform exactly as well and as persistently on Mondays, his poor days, as on Fridays, when he was in his optimal state. On Mondays decisions and discriminations were harder to make, concentration was poor, perception was dulled and critical analysis was more difficult; yet he exacted the same standards of production during his least effective as during his most effective days. He was aware, when doing this, of an uncomfortable feeling of being driven and under pressure. By the middle of the afternoon he felt exhausted and as if a few minutes' sleep would refresh him. This he denied himself, and at about this time the headache would begin.

Again in these subjects are exemplified a lack of plasticity and an intolerance concerning bodily endowment and cycles of energy. This unrelenting attitude toward variations in personal effectiveness or cycles of changes in mood was characteristic of many subjects in this group.

Hurry, or the tension that was associated with the attempt to get something done at a certain time, with the apprehension that it could not be done at this time or only incompletely done, precipitated attacks. In the words of one patient:

From the standpoint of migraine, the year beginning July 1 had been noteworthy because of the infrequency and the mildness of attacks. During this period the amount of work in which I had been engaged just filled each day, making it possible to maintain certain personal ideals of perfection. Since November the greatest amount of concentration had been directed to quantitative determinations in a large number of microscopic sections of tissues. Frequent, short periods of this rather monotonous work during almost every day had not been unpleasant.

On February 4, it was suggested that an attempt be made to complete this research sufficiently to present an abstract of the work to a scientific society within sixteen days, for consideration as a presentation at a later date. Accepting this suggestion, I therefore increased my concentration on this problem by working in the evening. It soon became evident that the amount of work accomplished was falling far short of any schedule that would produce a sufficient number of figures within this time, and, furthermore, the work was for the first time becoming distasteful. In the night, after the second evening in the laboratory, I was awakened by an ache over the right eye associated with nausea. After a period of semiwakefulness sleep was resumed, and the next day the only trace of a headache was pain in the right side of the head on coughing. After the third evening of laboratory work I was awakened at about 4 a. m. by an ache over the left eye associated with nausea. Unlike the symptoms of the previous night, they rapidly increased in severity until it became necessary to sit in a hot bath to secure some relief. When I returned to bed the pain and nausea resumed their former severity, and 1 grain of codeine finally relieved the symptoms and allowed a few hours of sleep. During the entire next day there were nausea and a constant severe generalized headache extending downward into the back of the neck, which was made worse by walking, talking or reading. The following morning the symptoms had vanished.

The incident just described is important in my history of migraine, because in a year characterized by mild, infrequent and isolated attacks and by an unvarying, happy level of activity, a sudden spurt of effort directed against a too formidable opponent, the passage of time, was associated during a period of sixty hours with two migrainous headaches, the latter of which was one of the few severe ones ever experienced.

One man's attacks were increased considerably in intensity and frequency during a period of commuting between his suburban home and the city, where he worked. The need for arbitrarily beginning and ending his work day was not readily acceptable to this man, who was distressed by hurry. Hurry and frustration were factors in the precipitation of attacks of migraine in several women during or after a long day of shopping.

*Sexual Adjustments.*—Sexual maladjustments and dissatisfaction in marriage gave rise to situations that were common precursors of the attacks of migraine. In fact, marriage dated the onset of migraine in four instances.

One woman, after being courted for three years by a man to whom she was deeply devoted, quarreled with him on some minor issue. Because of her stubbornness no compromise was made. During the lonely, restless and depressed state that followed she allowed herself to be wooed by another man, whom she married. Almost immediately after the marriage she recognized that she had made a mistake. She became distressed and dissatisfied, and therewith there developed the first of a series of periodically recurring sick headaches. In her words, "Things go along, and we get along, but always I know there is something lacking between us."

On the other hand, a second subject, who was in love with her husband at the time of marriage, became aware of unacceptable defects in his character toward the

end of the first year of married life. After the birth of a child she lost all respect and devotion for him and became sexually frigid. Migraine began at this time, and the attacks were frequent and severe during the next three years, with the exception of a period of three months when her husband was away on business.

A housewife, dissatisfied with married life and not in love with her husband, also frankly dissatisfied with her economic and social status, regularly had headaches when she returned to her city apartment after having been away for the summer in a small isolated cottage. The city environment was especially unattractive to her and, as she expressed it, "forcibly defined my middling financial and social status." Moreover, during the summer she saw her husband once a week, but in the city, every evening.

A woman who frankly feared pregnancy, several times had a nightmare in which she dreamed that she was delivering herself of a baby. On such occasions she cried out in her sleep and awoke with an attack of migraine.

Sexual maladjustment of another variety was noted in three migrainous men with vigorous sex drive who were married to sexually indifferent or frigid wives. During enforced complete or partial continence the attacks of migraine in these men were accentuated in frequency and intensity.

Although the simpler sexual adjustments seemed to be adequately made, one subject lived under sustained tension as an accompaniment of her drive at work and the socially unacceptable aspects of her domestic relations. This divorcee, aged 32, had had headaches from the age of 22. She was married at 19, and for eleven months the marriage failed to be consummated. Then she resolved "to go through with it" and had a child. Within six years she was divorced from the husband, never having had a satisfactory sexual adjustment. Subsequently she worked, supporting herself and her child, and became the "star" saleswoman in a highly competitive department of a big New York store. The attacks during the latter three years, when she had been under particular pressure at her work, became steadily worse, notwithstanding that during this time she had established an extramarital sex relationship with a sympathetic man to whom she could adjust herself sexually and whom she hoped to marry. Although she denied that the sexual relationship caused her any anxiety, added tension actually resulted from conflict about her antisocial deportment.

A Roman Catholic medical student aged 25 had had migraine for eleven years. Beside striving to excel in classwork, he held a part time position as night clerk in a hospital. The attacks of migraine during the last three years had become more frequent and severe. In addition to the pressure caused by night work and the competition in his classes, he added to his tension by having sex relations with his fiancée, to whom he was devoted but whom he could not afford to marry. Although his statements concerning this relationship were those of an ostensibly emancipated person, his religious and moral preoccupations were out of harmony with the extrasocial course he was obliged to pursue. He eagerly sought approval from his physician.

Attacks in women just before or during menstruation were not uncommon. Several women were physically uncomfortable during this period, and this, added to the burden of domestic routine, precipitated attacks. In one woman, who frequently had attacks just before menstruation, an interesting correlation was observed. This subject had noted variation in the intensity of her sex urge,



which was more active during the first week following the cessation of menstruation and declined thereafter until just preceding the next menstrual period, when she was frigid. She declared that sexual intercourse during the postmenstrual week was pleasant and satisfied her, but during the premenstrual period it was always unpleasant and was followed within twenty-four hours by an attack of migraine.

Two women who had no satisfaction from and who disliked intimate sexual relations regularly suffered attacks after sexual intercourse.

*Relation to Parents.*—The charged atmosphere created by parents who hate each other was the setting in which migraine developed in one tense, restless child, aged 12.

The mother had no interests and contacts other than her home and the child and frankly admitted, "Were any harm to befall the boy, I would end my life." The father likewise had no interests but those shared with the child. The child practically maintained the marital union by virtue of his devotion to both father and mother, and the intense hostility between his parents caused him great anxiety. He was preoccupied with a partially successful attempt at conciliation between the parents.

Attacks were precipitated in one child by the father's behavior during alcoholic intoxication. The subject, an only child aged 11, who stood at the head of an advanced class, suffered a state of fear night after night owing to the drunken father's quarrels with the mother. Lying in bed with chattering teeth, the child could hear the father shouting at and harassing the mother downstairs. The headaches became so severe that the child missed days at school. Ultimately, during a debauch, the father contracted pneumonia and died. The boy's headaches improved immediately. By this time, owing to much absence, he had fallen into a mediocre position in his class, and return to school again precipitated attacks. Inability to establish himself in a ranking position appeared to renew the tension which had been partly alleviated by the father's death.

A married woman, who was unusually attached to her mother and was separated from her for several years, often experienced headaches after writing to her. The writing would be the occasion of reminiscing and homesickness. Also, an unmarried woman, who had been supporting an overbearing, disgruntled father for many years, usually had an attack shortly after she answered her father's scolding letters. The letter writing in this subject was coupled with mixed feelings of loyalty and strong resentment.

*Social Relations.*—Anxious anticipation of social intercourse was a common precursor of migraine in many subjects. Some few unmarried women had headaches precipitated by anticipation of a social evening in the company of men; others had them as a result of mere anticipation of social contacts with new or perhaps unsympathetic persons. A few avoided as far as possible meeting new persons, especially when "off their own soil," unless they could be admittedly in the dominant position.

In the words of one woman, "I am too tense when I am in company. I cannot relax. I blush very easily without reason. I am not able to go forward the way I should. I'm backward." Another woman, successful in business, was made

extremely uneasy by social contacts. At such times she felt inadequate and dull and not up to the situation. An artist regularly had attacks after he visited socially his distinguished teacher. He expressed his dilemma by pointing out that his social relations with his admired master were a disappointment to him, since what he (the subject) said seemed inadequate and poorly expressed and what he could draw out of his teacher seemed trivial and inconsequential. He said, "I have the feeling of nothing coming of it all."

*Reaction to Bodily Inadequacy.*—Failure in adjustment to physical inadequacies was associated with the increase of both frequency and intensity of attacks of migraine, as the following abstract will illustrate.

An unmarried woman aged 28 had had attacks of hemicrania with nausea and vomiting from the age of 20. At the age of 15 she contracted tuberculosis, and thereafter she was obliged to spend longer or shorter periods in sanatoriums. For the first five years of her illness she accepted the enforced inactivity and limitations imposed by physicians with complacency, but then she became increasingly restless and at times found the routine and restrictions of her life extremely irksome. In fact, as the tuberculosis improved her tension and restlessness increased, and headaches were more frequent and intense. During the periods when she was less dissatisfied with her lot the headaches were less severe, and usually there was an inverse relation between the activity of the pulmonary disease and the severity of the headaches. After discharge from a sanatorium with the disease in an arrested state, she was unemployed and was obliged to live at close quarters with a tense, dissatisfied mother. During the next six months the migraine had become so severe that she sought aid. She felt insecure and hopeless about her future and wept when questioned. "It always upsets me when people ask me what I'm going to do, and I have nothing to say. It all depends on this or that state agency as to what I do next. On four occasions I've tried to go through with schooling, and I am unable to go on. I tried taking things philosophically for six years, and it didn't get me anywhere."

*Apprehension and Despair.*—Fear, the anticipation of pain or discomfort and anxiety associated with a visit to a physician's office were factors in bringing on attacks in certain subjects. Despair, added to maladjustment of long standing, exaggerated the frequency and intensity of attacks.

An alert, energetic, impatient woman, whose home life had always been unsatisfactory, found it becoming increasingly so as her sister-in-law took over the household duties. Her son was unsuccessful in school and work, and her husband was facing old age without any provision for it. The isolation of her home cut her off from social contacts; an increasing deafness and fear of prolonged illness robbed her of that satisfaction which housework had given her throughout life. In short, with the growing frustration the headaches which had been present to a minor degree at long intervals for most of her life came at short intervals and were increasingly severe.

The reaction to a life incompatible with certain social standards was seen in one woman who had more frequent and severe attacks during the period when she and her family were "on relief." She stated: "If I were 'off relief,' I would be the happiest woman in the world." To her the acceptance of federal money was an admission of failure.

In general, sustained tension, with excessive striving and frustrated ambition, and anxiety about family, financial or personal security, to which might be added an unsatisfactory sex life, appeared to furnish optimal conditions in these subjects for the precipitation of attacks of migraine.

## COMMENT

The qualities of character which occurred so frequently among the migrainous subjects included in this study resemble those described by Abraham<sup>6</sup> and further elaborated by Fenichel<sup>7</sup> in his discussion of the patient with compulsions. Fenichel mentioned migraine as one of the accompaniments of this particular personality constitution. Meyer<sup>8</sup> has described a group of persons characterized by difficulty with decisions, doubts, rituals and fears and with anticipation of panic should fulfilment fail to be achieved. Anxiety and depression were common accompaniments. Such malfunctions were designated by him as "obsessive ruminative tension states." The tension and anxiety and the compulsive and repetitious behavior in the subjects studied at the New York Hospital may ally them with the psychopathic patients in these groups. However, these studies are not inclusive enough to establish definitely whether the personality features described are the forerunners of a neurosis of the obsessive-compulsive type. Furthermore, and possibly also owing to the method, no data were obtained which allowed these personality features to be correlated genetically with infantile anal attitudes.

The number of subjects studied is small, and hence to infer that all persons with migraine will be found to have the personality features and reactions mentioned is unjustified. However, since these subjects were unselected, they form in all likelihood a representative group of persons with migraine. It may therefore be postulated that many other persons with migraine have similar personality features and reactions.

The evidence indicates, and it is well to emphasize it, that there are a multiplicity of personality features, life situations and emotional reactions which are of importance in migraine. Therefore, it is futile and fallacious to reduce the problem to this or that element in the psychobiologic constellation.

Consideration of the genesis of the personal characteristics may be waived and the psychobiologic end-picture in terms of its possible rela-

6. Abraham, K.: *Ergänzungen zu Lehre von Analcharacter*, Vienna, Internationalen Psychoanalytischen Verlag, 1925.

7. Fenichel, Otto: *Outline of Clinical Psychoanalysis*, translated by Bertram D. Lewin and Gregory Zilboorg, New York, W. W. Norton & Company, Inc., 1934.

8. Meyer, Adolf: *Outline of Psychopathology for Use at the Henry Phipps Psychiatric Institute*, Baltimore, 1930; unpublished.

tion to the attack of migraine discussed. Bodily changes as accompaniments of strong emotion and stress are now generally recognized. It remains to consider what change can give rise to the visual phenomena, the throbbing, oftentimes unilateral pain in the head and the gastro-intestinal disturbances. Although no certain answer is forthcoming, the following consideration may be significant. Among the more important phenomena associated with the attack of migraine are the changes in the caliber of the blood vessels, giving rise to facial pallor or flushing and sensations of chilliness. Also, it is known that any alterations in the lumens of the cranial blood vessels, especially those in the brain coverings,<sup>9</sup> may give rise to pain, presumably from stimulation of afferent nerve endings about them. It is conceivable, therefore, that the end-steps in the processes leading to the attack involve cranial blood vessels and sensory pathways. In addition, and often independently of this type of sensation, excessive or sustained contraction of the muscles of the neck and scalp may be a factor in the discomfort.

Hence, in these particular subjects, with special predisposition and psychobiologic equipment that tended to create sustained pernicious emotional states and fatigue, it may be reasonable to postulate that labile physiologic mechanisms within the cranium were set off which ended in the untoward chain of events constituting the attack of migraine.

The personality functions of these migrainous subjects were, therefore, of such importance as to be, pragmatically considered, the most relevant factors. In some subjects lack of plasticity prevented change, but in others modification of the drive and the uncompromising attitude toward personal equipment and environment made it possible to alter the course of their behavior so that headaches were reduced in intensity and frequency.

Of the fourteen subjects in this series who presented themselves as patients and who made an effort to deal with their problems, twelve secured relief, in the sense that the attacks became fewer and less severe. In no instance during a two year period of observation did the headaches disappear entirely, but in five persons who had had attacks at two week intervals the episodes were reduced to three or four a year.

The aforementioned attitude formulated toward attacks of migraine was therefore helpful. Correlations between the incidence of attacks of

9. Clark, Dean; Hough, H., and Wolff, H. G.: Experimental Studies on Headache: Observations on Histamine Headache, *A. Research Nerv. & Ment. Dis. Proc.* **15**:417, 1935. See also subsequent communication by Graham and Wolff, to be published.

migraine and personality features, situations and emotional reactions often became apparent to the subject when he viewed his life experiences in terms of a longtime span. Consequently these subjects were sometimes able to take a constructive attitude toward the disability; and, although unable to eradicate the headaches immediately or completely, they experienced greater security when they appreciated that the situation was in their hands. As long as the intensity and frequency of the attacks appeared to be altogether fortuitous and disconnected from life experience, these order-loving persons were especially distressed, whereas awareness that they could control the attacks, should they be so inclined, was a source of satisfaction. Small amounts of sedative medication and prolonged hot baths were useful adjuncts in allaying tension, especially during the period when attempts at the establishment of new habits were being made.

It is suggested that in addition to allergic, biochemical and roentgenographic studies, persons with migraine be investigated as to their personality in this comparatively simple way in order to determine to what extent psychobiologic factors may be important.

#### CONCLUSION

A psychobiologic study of forty-six subjects with migraine has revealed that these persons were so constituted as to be peculiarly prone to the development of pernicious emotional states, either sustained or with acute episodic exacerbations. In certain of them a sudden increase in stress was provoked by clearly definable life situations. Such periods were associated with an increase in the intensity and frequency of attacks of migraine.



## PROGNOSIS IN CHILD PSYCHIATRY

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The days are still recent when most difficulties of a psychiatric nature were classified, evaluated and treated largely on the basis of their anticipated outcome. The diagnosis expressed hope or doom, contained in itself a foreboding of things to come and was tantamount to prognosis. A sounder era was inaugurated when Adolf Meyer, disinclined to make the prediction of human destinies dependent on prophetic cock-sureness, undertook to free patients from their diagnostic and prognostic strait-jackets. Equally remote from pessimistic gloom and trivial optimism, he introduced a much needed melioristic attitude which does not disregard danger signals and ominous directions and, at the same time, has an open mind for helpful, constructive possibilities. The whole issue has shifted from one of rushing vaguely and overenthusiastically into the field to seek a "cure" for "dementia praecox" or "delinquency" to one of studying soberly the individual patient and looking for ways to help him to the full extent to which help is at all possible. This middle road between quixotic windmill storming and dismal defeatism has tended to release the psychiatrist from self-imposed, oracular obligations. Prognosis ceases to be an absolute prediction of the extremes of "cure" and "failure"; it comes to be a relative sizing up of feasible opportunities and available resources, tempered by the recognition of obstacles that may be encountered in the person and his environment. Prognosis has thus been detached from diagnostic labels and attached more to the problem of therapeutic potentialities and practicabilities in dealing with individual patients.

The growing emphasis on genetic-dynamic developments and a wholesome desire for efficient prophylaxis, as exemplified by the spread of the mental hygiene movement, have focused search-lights on the period of childhood. End-products were traced back to early beginnings. Yet retrospective anamnesis was not considered sufficient. A new curiosity has arisen for looking forward, for recognizing beginnings as they begin. The child psychiatrist today is often confronted with the questions: Has your experience led you to discover early criteria of future schizophrenic reactions? Can you single out preschizophrenic children among the number who come before you? Have you found means of foretelling later psychotic, criminal, alcoholic or general "psychopathic" and "sociopathic" calamities? Have you been able to establish dependable aids for such prognostications?

These are weighty questions indeed. One cannot deal in human futures as some persons, with questionable propriety, deal in grain or cotton futures. Nor can behavior be predicted in the same sense as atmospheric conditions. It is not too difficult, however, to indulge in generalized prognosis, at least to some extent. It is safe to say that children who come of sound stock and are brought up in stable surroundings and who have developed normally and have offered no major difficulties may be expected to continue to mature satisfactorily, whereas children who issue from unbalanced progenitors and are raised amidst neglect, squalor, upheavals and misconduct and who have given evidence of failure to keep the proper pace intellectually, emotionally and socially will require a great deal of psychiatric effort. It is known, however, that some schizophrenic patients are said to have been "model children" and that some *enfants terribles*, early corner lot idlers and sowers of wild oats have later settled down to the business of living in a responsible manner.

It is not too difficult to predict the future trend of a number of conditions which experience has shown to take a certain course. It is known, for instance, that nodding spasms in most cases disappear in the second year of life, that breath-holding spells in many cases cease in the second or third year, often giving way to temper tantrums in untreated or maltreated children, that pyknolepsy terminates during pubescence or early adolescence, that feeble-minded children will be feeble-minded adults, that the great majority of mongolian idiots will not live to be 20 years of age, that the growth and intelligence of thyroid-treated cretins are likely to rise to some extent for a time and that (despite the contempt in which the term is held by many persons) many children may and do "outgrow" some difficulties, such as thumb-sucking, enuresis and baby talk.

There was a time when the refreshing vigor of the budding mental hygiene movement induced some of its enthusiasts to foretell the decimation of the number of admissions to psychiatric hospitals and prisons. "If one only could get at people at the very onset of their difficulties," so it was reasoned, one might prevent the development of many psychoses and delinquencies. This optimism, however laudable and stimulating, failed to consider a number of important realities. The structure of competitive society, with its philosophy of "sink or swim," confronts even the strongest and soundest with dissatisfactions, frustrations and frictions and with the necessity of continuous adjustment and readjustment, compromise and acceptance of fractional attainments. One must face the fact that there are all sorts of inherent limitations and handicaps and all sorts of thwarting, taxing and weakening events which may cause the less strong and sound to be bent by, rather than to bend to, various pressures and exigencies. No matter how early one studies the children, one cannot do away with the fact that they have come

from somewhere—from relatively stable or unstable, healthy or sick, adjusted or maladjusted backgrounds and that the original mold has been cast, however plastic and pliable it may be. Nor can one close one's eyes to the observation that psychiatric efforts are carried out in the laboratory of life, a laboratory capable of yielding explosive as well as invigorating by-products, both of which may at any period play havoc with rigid and favorably or unfavorably finalistic predictions.

As a fact, prognosis is not really a gnosis, a knowledge of all that the future holds in store with regard to this or that difficulty for which a person is being treated. Brugsch,<sup>1</sup> implying a far broader connotation, said:

We understand prognosis to be the physician's evaluation of a human being, whether he be healthy or ill; it is essentially the medical sizing up of personality.

Hence, in medicine, and more especially in psychiatry, one must replace the old generalizing habits by the establishment of criteria for individual prognosis. In work with psychiatric problems of children it has been found that these criteria depend on the goal, the patient, the type of problem, the therapeutic possibilities and—last but not least—the time factor.

#### THE GOAL

The degree of satisfaction or dissatisfaction with developments is based on one's ambitions and expectations. One group of workers strives for the solution of conflicts believed to be rooted in infantile sexuality; another tries primarily to lift the patients from the depths of feelings of inferiority and insecurity; still another chooses the path of correcting supposed endocrine imbalance. The ideal aim of the pluralistically oriented worker is the adjustment of all that is maladjusted in the individual child and his specific environment; his practical aim is the adjustment of all that can be adjusted at a given moment. For this reason, he is not bound by restrictions of method. Unhampered by preconceived ideas of emphasis and technic, he can afford to deal with every problem in its own light. He can, in every instance, set his goal in accordance with that which is attainable. This relativism saves one from perfectionism, on the one hand, and from nihilistic despair, on the other. It saves one from wanting to play God and transform personalities. Given a specific complaint, a specific child and a specific setting, the initial goal presents itself clearly as the task of ameliorating the difficulty complained of, with full consideration of the existing aids and obstacles. This goal can then be broadened by following the patient for a sufficiently long period to insure continuance of therapeutic contacts after the cessation of the disturbing "symptoms."

1. Brugsch, Theodor: *Allgemeine Prognostik oder die Lehre von der ärztlichen Beurteilung des gesunden und kranken Menschen*, ed. 2, Berlin, Urban & Schwarzenberg, 1922, p. 6.

## THE PATIENT

The practical goal, both in psychiatry and in education, varies, of course, with the individual child. Children, to be sure, grow up amidst established group standards of living, convention, modes of personal interrelationship and ethical and cosmic orientation. They are expected to fall in line with the norm. But normality is by no means synonymous with uniformity. The educator, whether he be a parent, a teacher or a psychiatrist, cannot make of child rearing a procrustean bed into which all must fit perforce. On the contrary, the expectation must be made to fit the uniqueness of a child's personality, not without due regard to the standards of his family and social group; it must be based on the facts of his constitutional and environmental background, development, age and past and present performance and the directions indicated by these facts. Sufficiently accredited tests, of which the Gesell and Binet-Simon tests, the form board and the mechanical aptitude batteries are outstanding examples, offer additional help. The child's physical health must also be taken into account. A moderately retarded pupil's vocational prognosis may look poor to his overambitious parents, who hope for a professional career; yet it may be wholly satisfactory if properly attuned to his real abilities and inclinations. Conspicuous peculiarities of behavior may, rightly or wrongly, evoke in the psychiatrist the anticipation of impending disaster. But it makes a difference whether such an anticipation, satisfied with old time diagnostic and prognostic generalizations, is allowed to degrade to an excuse for folding the hands and shrugging the shoulders or is made to serve as a challenge to mobilize the constructive forces in the individual child and his environment and all that modern mental hygiene has to offer. With a balanced respect for a child's assets as well as limitations, there should be no room in psychiatric prognosis for a paralyzing sense of inevitability.

## THE TYPE OF PROBLEM

The variety of problems that come before the child psychiatrist is legion. Their degree of severity ranges from occasional disobedience to dangerous delinquencies, from transient obsessions to committable psychoses, from hardly noticeable blinking to multiple tics, from slight lisping to stuttering with associated contortions, from casual refusal to eat cooked carrots to distressing food capriciousness with vomiting and malnutrition, from mild delirium to postencephalitic behavior changes, from a febrile convulsion to epileptic deterioration. It goes without saying that prognosis depends to a large extent on the type, severity and modifiability of the condition and on the particular child presenting the particular difficulty. It is true that the complaint is only a starting-point, a sign-post for planned investigation and treatment, and that

the clearing up of a "symptom" is not the sole aim of psychiatric therapy. But the persistence or aggravation, the disappearance or attenuation of the difficulty that has formed the nucleus of the complaint may well serve as an indication of trends—a sort of prognostic barometer. At the same time, it is significant to know not only what the complaint is but whose it is. Worry about "poor progress at school" may be the burden in a number of cases. It may be the realization of failure of a retarded but conscientious and heroically struggling pupil in a grade which is beyond his ability; prognosis will depend on proper grade adjustment. It may be an obsessive child's subjective dissatisfaction with objectively satisfactory marks; the outcome will be based on reassurance and the result of treatment of the obsessions. It may be a parent's or a teacher's perfectionistic standards to which the child does not live up; in this case, not the child but the parent or teacher needs correction of his or her attitude. Or it may be a visual or auditory defect or a specific reading disability that keeps the child from doing good work; prognosis is linked up closely with the attention given to the defect. The same consideration holds true for many other complaints. Sometimes much can be done for the patient though his fundamental difficulty cannot be remedied. Much can be done for a child with epilepsy though he continue to have convulsions, for the adjustment to life of a feeble-minded child though nothing can raise his intelligence quotient, for the blind or deaf child though his vision or hearing cannot be restored.

#### THE THERAPEUTIC POSSIBILITIES

It is therefore obvious that prognosis depends not only on what one finds but on what can be done about it. This, in turn, hinges on the resourcefulness of the psychiatrist, the cooperation of the family and the available facilities of the community. Cooperation is not a fixed quality that persons either do or do not possess. The attempt to create it is one of the principal aims of psychiatric treatment. The relative number of uncooperative parents is, in a way, a measure of the physician's effort and skill in this direction. But it is true that much that could be done is often obstructed by the stubborn resistance of parents whose consent is required by law or policy in cases of school adjustment, boarding home placement or imperative institutionalization. One cannot effectively treat delinquent children in their homes so long as antisocial attitudes prevail in the families and neighborhoods. These factors have a powerful influence on the prognostic outlook. The communal facilities for the care of problem children are also far from being what they should be:

Financial inadequacy, political meddlings, the indifference and ignorance of legislators and the lack of progressivism and vision on the part of some of our



courts are facts which cannot be disregarded. The present state of psychiatric knowledge may not be ideal but it is far abreast of the social structure of our day. It is a good thing to realize this state of affairs and include in one's calculations the limitations which it implies. . . . Some of our commonwealths are more progressive and considerate and better equipped economically than others and are leading the way to improvement. Besides, the open-minded physician will not permit himself to be stunned by these difficulties. He will assume a melioristic viewpoint, which will cause him to do the next best thing if the best thing is beyond his reach.<sup>2</sup>

#### THE TIME FACTOR

Time is a valuable prognostic aid. Time plays the part of an unbiased moderator in the debate between that which one foresees and that which actually occurs. Time teaches that little can be taken for granted in the face of ever changing events and combinations of circumstances. The complex nature of psychiatric treatment, which necessitates the inclusion of the patient, his family, the school and the social forces, may well succeed in regulating the management and performance of tomorrow and the day after tomorrow and in determining a course of actions and happenings. But it is neither omniscient nor omnipotent. It cannot, and does not intend to, chain the physician and the patient for all time to an initial therapeutic arrangement and a first prognostic impression. Provisions can be made for continued observation and alterations of the program whenever they are indicated. Confidence can be created, so that the child is promptly returned when further difficulties or perplexities arise. Medical and communal progress sometimes brighten a formerly less cheerful outlook. The past few decades have changed for the better the life destinies of cretins through the introduction of thyroid treatment, of patients with dementia paralytica through inoculation with malaria, of retarded children through more adequate educational and vocational preparation, of the so-called congenitally word-blind nonreaders through specific methods of instruction, of many children with conduct disorders through ever improving opportunities for mental hygiene and child guidance, of delinquent and dependent children through psychiatric work in juvenile courts. There is good reason to believe that this type of progress will continue. Educators are becoming more and more interested in the personality development of children, over and above the task of imparting certain types of information. Pediatricians have of late attested their sincere eagerness to assume their part of responsibility; their participation, reenforced by increasing opportunities for undergraduate and later training, may well be hailed as a major contribution to psychiatric prophylaxis.

2. Kanner, Leo: *Child Psychiatry*, Springfield, Ill., Charles C. Thomas, Publisher, 1935, p. 118.

Prognosis in psychiatry was until recently based in reality on retrognostic reconstruction of that which had already taken place. Kraepelinian classification, having found that episodes of what it called manic-depressive psychosis were mostly of limited duration, gave a good prognosis to the course of a single manic-depressive attack. Having found that in many cases what it called dementia praecox led to deterioration, it gave a poor prognosis to a condition so diagnosed. To be able to establish any sort of criteria for determining the direction of children with personality difficulties (that is, individual children with specific difficulties), it will be necessary to observe a representative number of patients, presenting a sufficient variety of difficulties, throughout the years of growth and maturation. This observation, to be sure, will have to be coupled with continued therapeutic guidance. It will include an account of what the child does and what is being done to him from birth through infancy, childhood, pubescence and adolescence. It will gather essential informative data from the patient, the family, the school and the social agencies. It will record abilities and disabilities, performances, attitudes, adjustments and maladjustments, physical illnesses, major events in the life of the family, progress and behavior at school, choice of vocation and everything else that counts. It will watch the child's ways of going through his daily routine, his formation of religious ideals, the evolution of his sex interests, his recreational and social activities, his degree of initiative and self-dependence, his emotional responsiveness and his hobbies and aversions. It will pay particular attention to the difficulty complained of at the time of the first contact and to later difficulties and their improvement or failure to improve under the therapeutic arrangements undertaken with the child and with the family and community in his behalf.

Such a program was started two years ago at the Harriet Lane Home, the pediatric clinic of the Johns Hopkins Hospital, where a psychiatric service has existed for a little more than six years. Children, varying in age from a few months to 14 years, are referred for psychiatric examination and treatment because of a multitude of problems of development and behavior. Every patient is then followed through the family, the school, the child-caring agencies, repeated interviews with the child himself and his work record when he has reached employment age. The data already accumulated are enlightening and promise to furnish reliable criteria for prognosis. They bring into play the value of present day therapy, the part played by the constitutional background, environment and social forces and the rôle of unpredictable contingencies. These children will be followed for many more years. It is hoped that this type of protracted study will, among other results, throw more light on prognosis in child psychiatry.

## SYPHILITIC ARACHNOIDITIS OF THE OPTIC CHIASM

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Syphilis is ever a transgressor, spreading from one focus to neighboring structures. The optic chiasm is not exempt, and since it is near other important parts of the brain, the syndrome produced is, as in other situations of syphilis, an accident of location. The 5 cases of syphilitic chiasmal arachnoiditis to be described were observed in the neurologic service of Dr. Foster Kennedy at the Bellevue Hospital. Four patients presented the characteristic chiasmal syndrome of primary atrophy of the optic nerve and heteronymous visual field defects, usually bitemporal.<sup>1</sup> The fifth case was atypical in that there was a different ophthalmoscopic picture, consisting of marked bilateral papilledema without any increase in intracranial pressure or dilatation of the ventricular system. It is included in this report because the condition is significant as a clinical entity.

Syphilitic arachnoiditis of the optic chiasm is of interest for two reasons: (1) It emphasizes the importance of syphilis as an etiologic factor in diseases of the optic chiasm, and (2) the nature of the underlying pathologic process is such that it compresses the optic chiasm and nerves, thereby offering a basis for the surgical relief and prevention of blindness, which is the most important consideration in the treatment of this disorder. Although syphilitic arachnoiditis of the spinal cord is familiar to the neurologist and neurosurgeon, the literature contains few references to similar lesions of the optic chiasm. The scarcity is striking when the number is contrasted with the numerous reports of cases of nonsyphilitic chronic cisternal arachnoiditis,<sup>2</sup> a con-

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From the Neurological Service, Cornell Division, the Bellevue Hospital.

1. (a) Cushing, Harvey: The Chiasmal Syndrome of Primary Optic Atrophy and Bitemporal Field Defects in Adult Patients with a Normal Sella Turcica, *Arch. Ophth.* **3**:505 (May); 704 (June) 1930. (b) Cushing, Harvey, and Eisenhardt, Louise: Meningiomas Arising from the Tuberculum Sellae, with the Syndrome of Primary Optic Atrophy and Bitemporal Field Defects Combined with a Normal Sella Turcica in a Middle-Aged Person, *ibid.* **1**:1 (Jan.) 1929.

2. (a) Heuer, George J.: The Surgical Approach and the Treatment of Tumors and Other Lesions About the Optic Chiasm, *Surg., Gynec. & Obst.* **53**: 489, 1931. (b) Frazier, Charles H.: Cerebral Pseudotumors, *Arch. Neurol. & Psychiat.* **24**:1117 (Dec.) 1930. (c) Davis, Loyal, and Haven, Hale A.: A Clinico-Pathologic Study of the Intracranial Arachnoid Membrane, *J. Nerv. &*

(Footnote continued on next page)

dition which produces the same characteristic chiasmal syndrome. This is strange indeed, for the symptom complex of basal syphilitic meningitis, with its multiple implications of the cranial nerves, is not uncommon and is readily diagnosed, even when the pathologic process extends as far forward as the olfactory lobes. In syphilis of the central nervous system meningitis at the base of the brain is a frequent occurrence, especially around the chiasm and in the interpeduncular region. In this condition the association with paralysis of the optic, the oculomotor, the trigeminal, the abducens, the acoustic or the facial nerve, either separately or in various combinations, points the way to the site and nature of the lesion. However, when the optic nerves and chiasm alone are involved, the arachnoid nature of the syndrome of atrophy of the optic nerve and visual field defects with no palsy of the other cranial nerves is frequently unsuspected or mistaken for parenchymatous syphilis, i. e., *tabes dorsalis*. In such cases of syphilis, when all other chiasmal lesions have been ruled out, the underlying process is arachnoiditis, and the imminent danger of blindness may be averted by surgical intervention.

The chiasmal syndrome, as is well known, may be caused by a variety of conditions: (1) intrasellar lesions (tumor or cyst of the hypophysis, hemorrhage into the hypophysis and syphilis of the hypophysis<sup>3</sup>); (2) suprasellar lesions (tumor or cyst), and (3) parasellar lesions (chronic cisternal arachnoiditis, aneurysm of the circle of Willis, tumor of the optic chiasm, the optic nerve, the olfactory groove or the sphenoid ridge, traumatic lesion of the optic chiasm, oxycephaly and heredodegeneration).

Full consideration has been given to the nonsyphilitic aspects of this subject in the recent comprehensive studies of Heuer,<sup>2a</sup> Davis and Haven<sup>2c</sup> and Frazier.<sup>2b</sup>

#### REPORT OF CASES

For brevity, only the relevant facts in the history and the pertinent findings in the physical and laboratory examinations are presented.

*CASE 1.—Headache for four years, anosmia for three years and progressive loss of vision for two years. Almost complete blindness in the left eye; temporal hemianopia in the right eye and bilateral primary atrophy of the optic nerve. Bilateral anosmia. Amenorrhea. Wassermann reaction of the blood 4 plus and*

Ment. Dis. **73**:129 (Feb.); 286 (March) 1931. (d) Horrax, G.: Generalized Cisternal Arachnoiditis Simulating Cerebellar Tumor: Its Surgical Treatment and End-Results, Arch. Surg. **9**:95 (July) 1924. (e) Puech, P.; David, M., and Brun, M.: Contribution à l'étude des arachnoidites opto-chiasmatiques, Rev. d'oto-neuro-opht. **11**:641, 1933; abstr., Arch. Neurol. & Psychiat. **34**:1325 (Dec.) 1935.

3. Kennedy, Frank, and Fisher, John H.: Syphilis of the Pituitary Body. Am. J. Syph. & Neurol. **18**:12, 1934.

*of the cerebrospinal fluid negative. Shallow sella, with poorly outlined clinoid processes. Craniotomy; liberation of chiasmal adhesions. Prompt improvement in vision.*

*Clinical History.*—R. B., a Negress aged 26, a cook, was admitted to the neurologic service at the Bellevue Hospital on Oct. 16, 1936, with the complaints of headache, anosmia and progressive loss of vision. The headaches had begun about four years before and were of intermittent type; they consisted of sharp pain radiating diffusely over the head, with a tendency to be localized in both temporal regions; they became steadily worse, and at times the pain was sufficiently severe to produce dizziness and loss of consciousness. Nausea and vomiting accompanied the headaches for two months prior to examination. Three years before admission to the hospital the patient's sense of smell was completely lost. Vision became impaired two years before and had become progressively worse. Amenorrhea occurred at irregular intervals during the preceding six years and had persisted for the last four months. There had been no polyuria or polydipsia. There was no history of syphilitic infection. The patient was married in 1924 and separated from her husband soon after. There had been one induced abortion and no childbirth.

*Physical Examination.*—There was complete bilateral anosmia. Visual acuity was greatly diminished; with the left eye the patient was able to detect only shadows and light, and in the right eye vision was 20/100. The visual fields showed marked defects (fig. 1): In the left eye only a small section of vision was retained in the lower nasal quadrant; in the right eye there was temporal hemianopia. The fundi showed bilateral primary atrophy of the optic nerve, which was more marked in the left eye. The pupils were equal and slightly irregular and reacted sluggishly to light but well in near fixation. Examination otherwise gave normal results; muscular power was good, and there was no atrophy; point to point tests were well performed; all deep and superficial reflexes were active and equal; the plantar responses were normal; all forms of sensation were preserved.

*Laboratory Examinations.*—The Wassermann reaction of the blood was 4 plus. Examination of the cerebrospinal fluid showed: initial pressure of 82 mm. of water; 20 cells, all of which were monocytes; positive reaction for globulin; negative Wassermann reaction, and colloidal gold curve, 0011221100. A roentgenogram of the skull showed an irregular, circular, moth-eaten area in the right parietal region, which suggested a syphilitic process. The sella turcica was large, the maximum anteroposterior diameter being 12 mm.; the posterior clinoid processes were porotic. There was no evidence of calcification.

*Diagnosis.*—The diagnosis was syphilitic chiasmal arachnoiditis.

*Operation.*—On Oct. 26, 1936, Dr. A. Kaplan reflected the usual right trans-frontal osteoplastic flap, and the dura, which appeared normal and under no tension, was incised. The exposed brain was milky gray, and there were many adhesions between the dura and the brain. These adhesions were present over the entire frontal lobe and its under-surface; by gentle and careful dissection they were freed, so that a good view was obtained of the right olfactory nerve. Further blunt dissection brought the right optic nerve into view, and this appeared to be somewhat flattened. The region of the chiasm was matted down with adhesions, which were eventually freed. There were no signs of neoplasm above or below the chiasm; the left optic nerve was not visualized.



*Postoperative Course.*—The patient made a good recovery and showed astounding and rapid return of visual function. About five days after the operation the patient was able to see fingers with the left eye, which previously had been blind. Studies of the visual fields (fig. 2), repeated two weeks after the operation, showed that vision was improving in both eyes and that the field defects were becoming much smaller. The patient also experienced acute postoperative diabetes insipidus and, several weeks later, localized convulsions of the left side of the face.

The clinical picture was that of the chiasmal syndrome, with extension of the process to the olfactory lobes. Despite the presence of

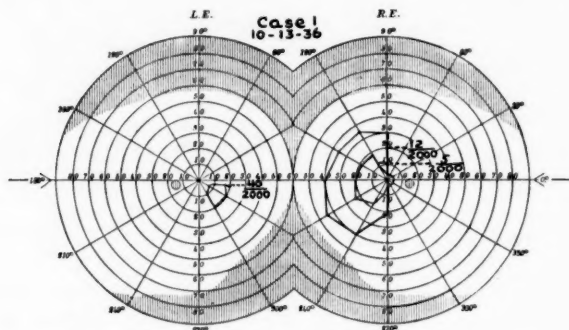


Fig. 1.—Visual fields in case 1, taken before operation. Without correction of vision the left eye could detect only shadows and light, and uncorrected vision in the right eye was 20/100.

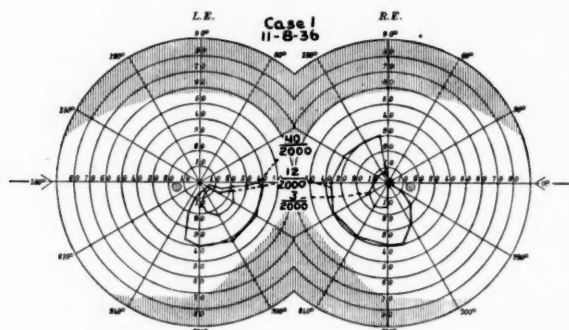


Fig. 2.—Visual fields in case 1, taken thirteen days after operation. Without correction of vision in the left eye the patient could count fingers. Uncorrected vision in the right eye was 20/100—1. There was marked improvement in both the visual acuity and the extent of the fields, as compared with the condition shown in figure 1. The patient manifested subjective improvement in the left eye on the second day after operation.

bone disease and the positive serologic evidence of syphilis, the question of an expanding suprasellar lesion was raised because of the abnormal size of the sella turcica and atrophy of the posterior clinoid processes. An encephalogram revealed no abnormality of the third ventricle or

other parts of the ventricular system. It was decided to operate rather than risk further delay because of the marked impairment of vision. Antisymphilitic therapy, which had been instituted, did not offer much promise of restoration of visual function. The postoperative result as to vision was excellent. Liberation of the optic chiasm from the meningeal adhesions had almost an immediate effect. Whether or not this improvement in vision will be permanent remains to be seen; the case will have to be followed for a sufficiently long time to permit an accurate estimate of the prognosis. The other postoperative sequelae are of interest. The acute onset of the diabetes insipidus may have been due to an unobserved traumatism or a pull of the chiasm on the adjacent walls of the third ventricle, stretching of the infundibulum or slight bleeding in this region. It was easily controlled with injections of solution of posterior pituitary, after which the water metabolism began to return to normal, even after the drug was discontinued. The localized convulsions of the face were probably due to adhesions overlying the precentral gyrus. A lumbar puncture at this time revealed normal intracranial pressure and clear fluid. The pulse rate and blood pressure remained good, and there was no reason to suspect postoperative bleeding, although for a time the patient's condition for some unknown reason became poor. One day the jacksonian convulsions became continuous and were eventually controlled by intravenous administration of sodium amytal. Since then the patient had improved steadily. When she was seen on November 28, she was generally in good health and had no convulsions; vision was steadily improving in both eyes.

The striking benefits which were derived from operation in this case contrast forcibly with the results in the following cases, which demonstrate the futility of even intense antisymphilitic medication in the treatment of the visual disturbance.

*CASE 2.—Progressive loss of vision for two years; almost complete blindness in the right eye for one year and complete blindness in the left eye for six months; loss of sexual desire; temporary girdle pains. Chancre. Bilateral primary atrophy of the optic nerve. Wassermann reaction of the blood 4 plus and of the cerebrospinal fluid negative. No operation. Intense antisymphilitic treatment. No visual improvement.*

*Clinical History.*—M. A., a man aged 40, who was unemployed, was admitted to the neurologic service at the Bellevue Hospital on July 13, 1932. He complained of marked and progressive impairment of vision, which had begun gradually about two years before; the left eye had been completely blind for six months. For two years he had also experienced flashes of light before the eyes. One and a half years before his admission he lost sexual desire. Ten days before admission he had severe girdle pains, which lasted two hours.

In 1919 he had a chancre, with a 4 plus Wassermann reaction of the blood. At the time of the initial lesion he was treated inadequately and received only three "shots" of arsphenamine. Two years prior to his admission, when the eye-

sight began to fail, antisyphilitic treatment was resumed and was administered steadily and intensively until two days before his admission. Malarial fever therapy was also given for a period of five weeks, in 1930. Despite this treatment, vision did not improve; he lost sight in the right eye in 1931, and six months before his admission, in the left eye.

*Physical Examination.*—There was bilateral primary atrophy of the optic nerve, with complete loss of vision in the left eye and little retention in the right eye. In the right eye a small sector of vision was preserved in the lower nasal quadrant, and visual acuity was 2/100; in the left eye not even light could be appreciated (fig. 3). The pupils were unequal, the right being larger than the left; they reacted in near fixation but not to light. Neurologic examination otherwise gave normal results.

*Laboratory Examinations.*—The Wassermann reaction of the blood was 4 plus on two occasions. The cerebrospinal fluid showed a normal pressure of 120 mm. of water; it was clear; the reaction for globulin was 1 plus; there were 4 cells; the Wassermann reaction was negative, and the colloidal gold curve was 0000000000. Roentgenography revealed enlargement of the sella turcica; as a result the possibil-

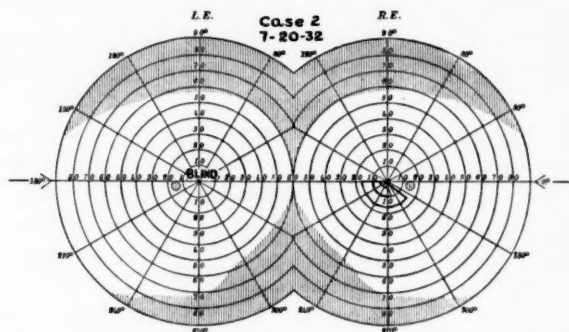


Fig. 3.—Visual fields in case 2. Without correction not even light was seen in the left eye, and in the right vision was 2/100. There was no improvement in vision with antisyphilitic treatment. Vision grew progressively worse in the right eye.

ity of a neoplasm was entertained. An encephalogram was therefore made; it revealed low grade internal and external hydrocephalus, retention of the normal butterfly figure of the anterior horns, complete visualization of the third ventricle and a chiasmal cistern.

*Diagnosis.*—The diagnosis was syphilitic chiasmal arachnoiditis.

*Treatment.*—Intensive antisyphilitic treatment with neoarsphenamine and mercury was given.

*Course.*—There was no improvement in vision; on the contrary, the small amount of vision which the patient had previously retained in the right eye continued to diminish until he became almost blind. He left the hospital of his own accord, on Oct. 24, 1933, but unfortunately did not return to the follow-up clinic and could not be traced.

Except for the history of girdle pains, which was not clear, the neurologic picture was entirely that of involvement of the region of

the optic chiasm. There were no signs of *tabes dorsalis*: The knee and the ankle jerks were normal; all forms of sensation were preserved, and gait was normal. The patient did not complain of pain while under observation. He had had girdle pains before his admission, and then only once, for two hours. His chief complaint was impairment of vision, which had begun eleven years after the appearance of the initial lesion, for which he was inadequately treated. Then, despite intensive antisyphilitic treatment and malarial fever therapy, the visual disturbance, once it had begun, progressed rapidly, leading to blindness in one eye within twelve months and in the other within eighteen months. Further antisyphilitic treatment in the ward was of no benefit so far as vision was concerned.

Although there was no exploration, the diagnosis of syphilitic chiasmal arachnoiditis were considered the most likely. An ophthalmologist might raise the question of *tabes*; a neurosurgeon, that of a sellar neoplasm. It is certain that this man was not tabetic. The enlarged sella was at first a troublesome factor in diagnosis; however, in the light of experience in case 1, in which the sella was similarly enlarged and no tumor was observed near or within the sella turcica at operation, this finding may be accepted as a variation within normal limits. Furthermore, in none of a series of 76 cases of verified tumor of the brain, to be considered in the section entitled "General Comment," was there positive serologic evidence of syphilis, except in 2 cases of gumma and in 1 of astrocytoma, which were not, however, in the region of the chiasm.

*CASE 3.—Convulsions for eighteen years. Chancre ten years before. Impairment of memory for five years. No visual complaints. Normal fundi. Irregular constriction of the visual fields. Exaggeration of deep reflexes and bilateral extensor plantar responses. Wassermann reaction of the blood 4 plus and of the cerebrospinal fluid negative. No operation. Antisyphilitic treatment. Vision progressively worse.*

*Clinical History.*—J. D., a man aged 41, a linotype operator, was admitted to the Bellevue Hospital on Aug. 17, 1932, with the following complaints: convulsions occurring about every three months for eighteen years before his admission, which were often preceded by great thirst several days prior to an attack. At such times he drank great quantities of water—about 1 or 2 gallons (3.5 or 7.5 liters) a day. There had been gradual impairment of memory and insomnia for four or five years. The patient had indulged heavily in alcoholic beverages. He had a chancre in 1922, for which he received a moderate amount of treatment.

*Physical Examination.*—The visual fields showed irregular concentric constriction, with a tendency to temporal hemianopia in the left eye, defects in the upper fields in the right eye and partial defects in these fields in the left eye (fig. 4). The fundi and pupils were normal. The deep reflexes were exaggerated, in keeping with extensor plantar responses bilaterally. Ability to do mental arithmetic and concentration were poor, but the patient was well oriented and had good insight into his condition.

*Laboratory Examinations.*—The Wassermann reaction of the blood was 4 plus. The cerebrospinal fluid was clear and colorless and under a normal pressure of 120 mm. of water; it contained 4 cells, a trace of globulin and 40 mg. of protein per hundred cubic centimeters; the Wassermann reaction was negative, and the colloidal gold curve, 0000000000. Roentgenography of the skull revealed a normal sella turcica. An encephalogram was made but the pictures were unsatisfactory owing to insufficient filling of the ventricles with air.

*Diagnosis.*—The diagnosis was cerebrospinal syphilis, with chiasmal arachnoiditis.

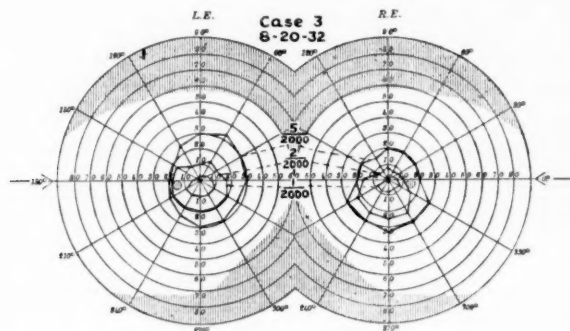


Fig. 4.—Visual fields in case 3.

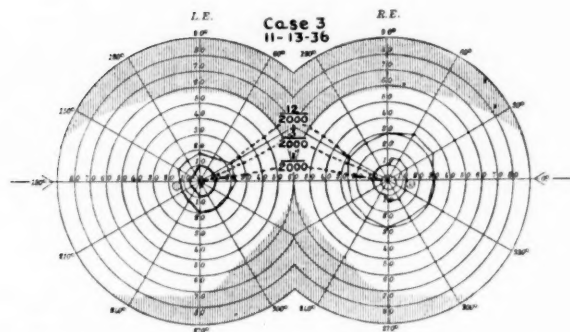


Fig. 5.—Visual fields in case 3, taken four years after those shown in figure 4. Uncorrected vision in the left eye was 20/50 + 1, and in the right, 20/40 — 1. Vision grew progressively worse, despite adequate antisyphilitic treatment. This impairment was evident when fields for test objects of approximately the same size are compared with the fields shown in figure 4.

*Treatment.*—Intensive antisyphilitic therapy was administered.

*Course.*—The patient did not return to the clinic until four years later, on Nov. 18, 1936, when he reported that vision had become worse, although in the interval he had received intensive antisyphilitic treatment. The fundi were still normal and showed no evidence of atrophy or blurring. The visual fields were more constricted than they had been in 1932 if one bore in mind that in the last



examination (fig. 5) larger test objects were used; with smaller objectives left homonymous hemianopia was suggested. Convulsions were less severe and less frequent.

When the patient first entered the hospital, he was not aware of any visual impairment, but although the fundi were normal, the visual fields were examined because of the findings in the other two patients with chiasmal syphilis, who were in the ward at the same time. Despite the progressive, but slow, loss of vision, the fundi remained normal and showed no evidence of primary atrophy of the optic nerve, this is not an unusual experience. Cushing<sup>1a</sup> has observed that a patient may have hemianopia, with vision reduced to 20/200 or below, and may present such a slight degree of pallor of the nerve head that there is a difference of opinion as to the presence of atrophy. The field defects may be disproportionate to the ophthalmoscopic findings.

The visual fields were of interest because they showed a tendency to concentric contraction, although some degree of hemianopia was present with smaller test objects; this type of constriction has been considered by the ophthalmologist as characteristic of the optic defects of tabes rather than of chiasmal lesions; yet the clinical picture in this case is not one of tabes but of cerebrospinal syphilis. Whether the chiasmal defect is due to arachnoid adhesions or to thickening of the arachnoid with dilatation of the prechiasmal cistern is difficult to say. Similar concentric field defects were reported in cases of chiasmal cisternal arachnoiditis<sup>2a</sup> and parasellar tumor.<sup>4</sup>

*CASE 4.—Trigeminal neuralgia for six years. Impairment of vision for two years. Bilateral primary atrophy of the optic nerve for six years. Contraction of the visual fields, with binasal hemianopia and defect in the upper field of the right eye. Results of serologic tests questionable. Antisyphilitic treatment. No operation. Slight visual improvement.*

*Clinical History.*—F. M., aged 31, a window washer, was admitted to the neurologic service at the Bellevue Hospital on July 26, 1932, with the complaint of haziness of vision for two years. He denied knowledge of a primary lesion but stated that in 1926 he was told that the Wassermann reaction of his blood was 4 plus and that he was given antisyphilitic therapy for ten weeks. The records showed that in 1926 he was admitted to the Bellevue Hospital under an assumed name, with the complaint of pain in the right side of the face. He presented at that time a picture characteristic of trigeminal neuralgia and bilateral primary atrophy of the optic nerve. Visual acuity in the right eye was 10/40 and in the left 10/100. The Wassermann reaction of the blood and the cerebrospinal fluid was repeatedly negative, even after a provocative dose of arsphenamine; the patient's statement that he had had a positive Wassermann reaction could not be confirmed. A diagnosis of congenital syphilis was made, and the patient was given intensive antisyphilitic therapy (nearsphenamine and mercury). The pain in the face subsided soon after treatment was started, and the patient remained free from

4. Dandy, W.: Prechiasmal Intracranial Tumors of the Optic Nerves, *Bull. Johns Hopkins Hosp.* **29**:154, 1918.

that symptom for almost six months, when the pain returned with such intensity that resection of the right gasserian ganglion had to be performed. Visual acuity in both eyes at the time of operation was 20/200.

In 1928 the patient had a mild infection of the upper respiratory tract, and in 1929, gonorrhea and a severe attack of influenza, with a temperature as high as 104 or 105.6 F. for several days. In 1930 his vision became "misty," especially in the right eye, for he "couldn't notice much with the left eye, anyway." In 1932 he entered the hospital again because his vision had become progressively worse for the preceding two years. He had had no headaches.

*Physical Examination.*—There was bilateral atrophy of the optic nerve, which was noted at the time of the first admission six years before. The visual fields showed irregular bilateral concentric contraction, with a tendency to binasal hemianopia and greater limitation in the upper fields of the right eye (fig. 6). Visual acuity was 2/10 in both eyes. There was also sensory impairment in the distribution of the right trigeminal nerve in all branches, the result of an operation for trigeminal neuralgia. The pupils were normal; neurologic examination otherwise gave essentially normal results.

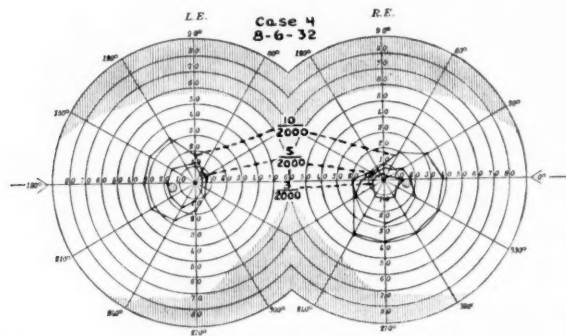


Fig. 6.—Visual fields in case 4. Uncorrected vision in the left eye was 2/10, and in the right, 2/10.

*Laboratory Examinations.*—The Wassermann reaction of the blood was negative. The spinal fluid was clear and contained no cells; the initial pressure was 150 mm. of water; the protein content was 40 mg. per hundred cubic centimeters, and the Wassermann reaction was negative. The colloidal gold curve was 0111000000. Roentgenography of the skull showed a normal sella turcica and well formed clinoid processes.

*Diagnosis.*—The diagnosis was syphilitic chiasma archnoiditis.

*Treatment.*—The patient was given a course of antisyphilitic treatment consisting of eight injections of neoarsphenamine and fifteen injections of mercury. Six years before he had been treated intensively for eight weeks.

*Course.*—Studies of the visual fields were repeated in eleven weeks; they were found to be definitely improved, more so on the temporal sides (fig. 7). There was little improvement in the binasal hemianopic defect. The patient was discharged on Dec. 9, but unfortunately he did not return to the follow-up clinic and could not be traced.

The primary atrophy of the optic nerve could not be considered of tabetic origin, for the neurologic signs of tabes dorsalis were lack-

ing. In view of the striking but temporary improvement in the trigeminal neuralgia at the outset in response to antisyphilitic treatment, and the improvement in the visual fields with similar treatment, together with the persistently negative Wassermann reaction, the case was considered one of congenital syphilis, involving not only the optic chiasm but the trigeminal nerve. Winkelman and Eckel<sup>5</sup> described 2 cases of meningovascular syphilis and syphilitic vascular disease of the cord, in which the diagnosis was verified at autopsy and the serologic reactions of the blood and the spinal fluid were persistently negative. In the absence of positive serologic evidence, the etiology remains in doubt.

CASE 5:—Severe headaches. Positive Wassermann reaction of the blood and the spinal fluid. Marked papilledema. Concentric contraction of the visual fields. No localizing signs. No increase in intracranial pressure. Antisyphilitic treat-

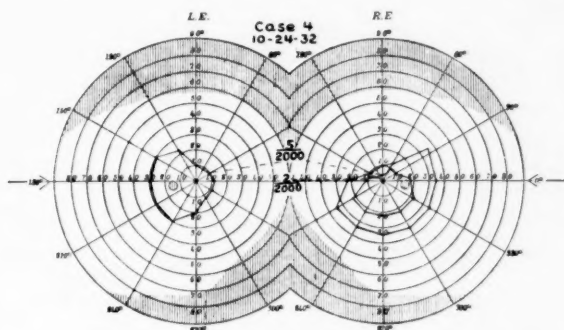


Fig. 7.—Visual fields in case 4, taken about eleven weeks after those shown in figure 6. Uncorrected vision in the left eye was 20/100, and in the right, 20/40 + 4. There was visual improvement with antisyphilitic treatment as compared with that shown in figure 6.

ment gave no permanent relief. Right subtemporal decompression gave no relief; papilledema remained unchanged. Autopsy disclosed perichiasmal syphilitic meningitis and gumma of the right parietal lobe.

*Clinical History.*—J. B., a woman aged 28, was admitted on March 14, 1933, complaining of moderately severe headaches on one side for eleven years, which could be relieved by acetylsalicylic acid. There had also been amenorrhea between the ages of 18 and 23 and since frequent and scanty menstruation. Six weeks prior to her admission the headaches became excruciating and paroxysmal and were accompanied by blurring of vision, tinnitus and vomiting. A few weeks before, she had been admitted to another institution for treatment for "meningovascular syphilis," with the following laboratory findings: Wassermann reaction of the blood 4 plus and of the spinal fluid 2 plus; colloidal gold curve 1122321000. Antisyphilitic treatment was administered.

5. Winkelman, N. W., and Eckel, John L.: Unusual Cases of Syphilis of the Nervous System, *Tr. Am. Neurol. A.*, 1931, p. 105.

*Physical Examination.*—There were marked bilateral papilledema and concentric contraction of the visual fields, with a tendency to nasal hemianopia in the right eye (fig. 8). The neurologic examination otherwise gave normal results. There were no localizing signs or indications of meningeal involvement.

*Laboratory Examination.*—After antisyphilitic treatment at another institution, serologic reactions were negative, both of the blood and of the spinal fluid. Lumbar puncture revealed an initial pressure of 280 mm. and a terminal pressure of 140 mm. of water; the cerebrospinal fluid was clear; it contained 3 lymphocytes per cubic millimeter and gave a 1 plus reaction to the globulin test.

*Diagnosis.*—It was thought that the condition was basilar syphilitic meningitis, with secondary hydrocephalus.

*Treatment.*—Antisyphilitic medication was administered.

*Course.*—The patient returned one year later, with the complaint of progressive loss of vision, especially in the past two weeks, which was worse in the right eye, and of sudden attacks of paresthesia of "pins and needles" in the left hand, accompanied by dizziness, which lasted from one to three minutes and

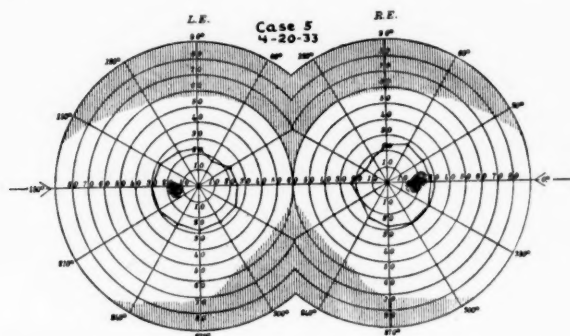


Fig. 8.—Visual fields in case 5. Concentric constriction and a tendency to nasal hemianopia were shown in the right eye. There was enlargement of the blindspots.

forced the patient to lie down. In the interval she had received antisyphilitic treatment, which was inadequate. Physical examination at this time revealed: bilateral papilledema of 4 diopters; semidilatation and slight irregularity of the pupils, both of which responded poorly to light but better in accommodation. The visual fields showed greater constriction, with enlargement of the blind-spot. Visual acuity in the right eye was 20/60 and in the left eye 20/50. The Wassermann reaction of the blood was negative and of the spinal fluid plus-minus. Because the treatment had been inadequate, the patient was given antisyphilitic medication, consisting of tryparsamide, bismuth and potassium iodide. The use of tryparsamide was discontinued after three doses, and the bismuth was changed for mercury because of a severe reaction. Repeated lumbar punctures and dehydration were also instituted, but to no avail. A tumor was suspected, and on May 1, 1934, a ventriculogram showed slight shifting of the ventricular system to the left but no dilatation. On May 7 a subtemporal decompression on the right side failed to relieve the symptoms or diminish the papilledema.

It was thought at first that the underlying mechanism was basal syphilitic meningitis which blocked the foramina of Luschka and Magendie, thus producing papilledema with headache. However, the ventriculographic findings indicated no internal hydrocephalus. Furthermore, the spinal fluid pressure was 160 mm. of water, but seldom higher (occasionally 240 mm.). On the basis of these new findings it was postulated that the condition was due to perichiasmic syphilitic meningitis involving the optic nerves. While receiving antisyphilitic treatment the patient experienced frequent remissions and exacerbations of headache and vomiting. The papilledema also varied in degree.

The patient was admitted for the third time on Sept. 24, 1934, in a semistuporous state. The long-standing papilledema then showed changes of secondary atrophy. The left pupil was fixed and the right sluggish. There were no definite localizing



Fig. 9.—Transverse section through the brain in case 5 (from the pathologic laboratory of Dr. Lewis Stevenson, the Bellevue Hospital). There were a gumma in the right hemisphere and absence of any significant internal hydrocephalus, despite long-standing papilledema, of one and one-half years' duration.

signs. Paralysis of the abducens nerve was present bilaterally. The spinal fluid pressure was 560 mm. of water; the fluid contained 110 cells, 79 per cent of which were lymphocytes, and was slightly xanthochromic. On October 3 a right parietal bone flap was turned down for exploration for a possible tumor in the right hemisphere, which was suggested by the shift of the ventricle to the left. The patient was in a comatose state when taken to the operating room. During the reflection of the flap she went into shock and the surgeon decided not to proceed with the exploration. She died twelve hours later.

*Autopsy.*—There was a gumma of the right parietal lobe (fig. 9), with perichiasmal syphilitic plastic meningitis (fig. 10). Pathologic examination, by Dr. Lewis D. Stevenson, was reported as follows: "The cerebrospinal fluid at



the base was turbid, and there was a thin layer of fibrin and tenacious mucopurulent exudate overlying the pia-arachnoid. This process was most prominent in the interpeduncular space and around the optic nerves."

Microscopically, "sections through the optic chiasm stained with hematoxylin and eosin and with Weigert's technic for elastic tissue combined with the van



Fig. 10.—Microscopic section (hematoxylin and eosin) through the optic chiasm in case 5, showing gummatous meningitis. The description by Dr. Lewis Stevenson appears in the text.

Gieson method showed gummatous meningitis in this neighborhood. There was a certain amount of fibrous tissue within the arachnoid, and in a small gumma in the meninges there were a number of large giant cells. Definite endarteritis obliterans was observed in some of the pial arteries, with more or less destruction of the internal elastic membrane in some vessels. There was also periarteritis

about many vessels. The exudate consisted of small, round mononuclear cells with scanty cytoplasm, many plasma cells and a large number of phagocytic cells. Within the chiasm itself there was definite syphilitic exudate about many of the vessels, similar in nature to that in the meninges. The microscopic diagnosis was gummatous meningitis of the optic chiasm."

The marked papilledema without a commensurate increase in the pressure of the cerebrospinal fluid pointed to a meningitic lesion around the chiasm, involving the optic nerves locally. In this case, removal of the gumma in the parietal lobe would not have improved visual function, for the impairment was apparently due not to increase in the intracranial pressure but to exudate at the base, enveloping and strangling the optic nerves and producing swelling of the disks through a local mechanism. Why this local process should produce papilledema in this case and primary atrophy of the optic nerve in other cases of syphilitic chiasmal arachnoiditis remains obscure.

#### RÉSUMÉ OF THE CASES

Two clinical types of chiasmal arachnoiditis were present in these cases: (1) the typical chiasmal syndrome, with primary atrophy of the optic nerve and heteronymous visual field defects (cases 1, 2, 3 and 4) although in case 3 the fundus was normal, despite the characteristic field defects, and (2) a different syndrome, characterized by marked bilateral papilledema without increase in intracranial pressure or dilatation of the ventricular system and with the visual fields concentrically contracted.

*Clinical Findings.*—Visual Fields: In the first 4 cases were revealed impairment of visual acuity and defects in the visual fields which were anatomically referable to the optic chiasm. In case 1 there was temporal hemianopia in the right eye, with blindness in the left; when improvement in vision began after operation, the bitemporal character of the field defect became more apparent, as the nasal fields were the first to improve (figs. 1 and 2). In case 2 there was total blindness, with preservation of vision only in a small sector of the lower nasal quadrant in the right eye, suggesting that the visual defect began in the temporal field (fig. 3). In case 3 the fields were irregularly constricted and showed a tendency to temporal hemianopia in the left eye and defects in the upper fields of the right eye (figs. 4 and 5). In case 4 there was irregular contraction of the visual fields, with binasal hemianopia and defects in the upper fields of the right eye (fig. 6). In case 5 the fields were concentrically contracted and showed enlargement of the blindspot (fig. 8). Blindness developed in cases 1 and 2 within two years.

**Optic Nerves:** Bilateral primary atrophy of the optic nerve was present in cases 1, 2 and 3. The degree of pallor, however, could not be used as a measure of the severity of the visual field defects. In case 3 the fundi appeared normal and gave no evidence of pallor, although the visual fields were markedly impaired and grew progressively worse during four years. In case 5 there was marked papilledema.

**Other Cranial Nerves:** In only 2 instances were additional cranial nerves involved; the trigeminal nerve in case 4 and the olfactory in case 1. In case 5 paralysis of the abducens nerve appeared only in the terminal stage.

**Presenting Symptoms:** Of the 5 patients with syphilitic chiasmal arachnoiditis, 3 requested admission to the hospital because of impairment of vision and 1 because of convulsions; in the latter the visual defect was a coincidental finding. Headache was complained of by only 1 patient.

**Serologic Reactions:** Serologic examinations gave significant results. The Wassermann reaction of the blood was strongly positive in 4 instances (cases 1, 2, 3 and 5). The Wassermann reaction of the spinal fluid was negative in all but case 5, in which it was 2 plus. The colloidal gold curve was abnormal in cases 1 and 5. Cytologic examination of the spinal fluid gave normal results in 3 cases and abnormal results in case 1, in which there were 20 cells. In case 5 there was pleocytosis, but only in the terminal stage.

In case 4 the Wassermann reaction of both the blood and the spinal fluid was negative. There was no evidence of increased intracranial pressure in any of the cases.

**Sella Turcica:** In 2 cases roentgen examination of the sella turcica revealed enlargement, possibly beyond normal limits. No abnormal calcifications were present. An encephalogram in 2 cases revealed normal structure. In case 5 the ventriculogram showed a shift to the left, due to a tumor (gunma) in the right hemisphere.

**Treatment.**—The outstanding result was obtained in case 1, in which a transfrontal osteoplastic flap was turned back and adhesions were exposed and liberated around the chiasm. This procedure was followed by immediate improvement in visual acuity and diminution of the field defects. Conservative treatment, consisting of intensive antisyphilitic therapy, was of little benefit; in case 2 the patient became blind, and in case 3, progressively worse; only in case 4 was there any improvement in the visual fields, and this was slight. In case 5, in which marked papilledema was presented, there was no improvement following antisyphilitic treatment or subtemporal decompression.

**Pathologic Changes.**—The underlying lesion could be studied in only 2 cases. In case 1, in which an exploration was made, dense adhesions

were revealed, which unfortunately were not studied microscopically. In case 5, in which autopsy was performed, there were diffuse perichiasmal gummatous meningitis, definite syphilitic exudate within the chiasm and a gumma of the right parietal lobe (figs. 9 and 10).

#### GENERAL COMMENT

It is evident that the clinical picture of syphilitic chiasmal arachnoiditis usually resembles the characteristic chiasmal syndrome and must be differentiated from other infectious processes and from neoplasm of this region. The differential diagnosis may be complicated by certain factors, which intrude into the clinical setting of a possible tumor of the brain to raise the question of syphilis. The reverse is likewise true. To answer these and other questions, a series of 76 cases of tumor of the brain was reviewed. These cases had been studied recently in the neurologic service at the Bellevue Hospital and included only those in which the diagnosis had been verified either by operation or at autopsy. The following topics were investigated: (1) the association of tumor of the brain and evidence of syphilis; (2) the incidence of the typical chiasmal syndrome in cases of tumor of the brain and its relation to syphilis; (3) the incidence of primary atrophy of the optic nerve in cases of cerebral neoplasm; (4) the significance of heteronymous visual field defects in association with syphilis and their relation to tabes dorsalis; (5) the incidence of pleocytosis, and (6) abnormal colloidal gold curves for the spinal fluid in cases of tumor of the brain.

*Association of Tumor of the Brain with Evidence of Syphilis.*—In 8 of the 76 cases of verified tumor of the brain there were evidences of syphilis, either from the history or by examination. A history of chancre was elicited in 4 cases, with negative serologic reactions. A history of a 2 plus Wassermann reaction of the blood several years prior to the patient's admission was obtained in 1 case, in which there were also negative serologic reactions at the time of examination.

Positive Wassermann reactions of the blood were present in 3 cases, in 2 of which (including case 5 reported in this paper) further examination disclosed a gumma of the brain, and in the third, an astrocytoma of the temporal lobe. In the last case as well as in case 5, there was a positive reaction of the spinal fluid.

The diagnosis of tumor of the brain was made in each of the 8 cases of this group through the presence of papilledema and localizing signs, with positive ventriculographic findings. In none of the cases was there atrophy of the optic nerve or other signs of involvement of the optic chiasm, so that the diagnosis of basilar syphilitic meningitis was not raised except in case 5, in which, in addition to a gumma of the brain, definite perichiasmal syphilitic meningitis with papilledema instead of

atrophy of the optic nerve was presented. This series of cases is, of course, too small to permit one to arrive at any incontrovertible conclusion as to the incidence of syphilis in cases of tumor of the brain; nevertheless, the incidence suggests that tumor of the brain, other than gumma, is rare in the presence of a positive Wassermann reaction of the blood.

*Incidence of the Chiasmal Syndrome in Cases of Tumor of the Brain.*—The chiasmal syndrome was present in 7 of the series of cases of tumor of the brain, and included 3 instances of adenoma of the hypophysis, 2 of suprasellar cyst, 1 of angioma of the hypophysis and 1 of metastatic carcinoma of the hypophysis. In all were shown atrophy of the optic nerve and visual defects, such as chiasmal arachnoiditis, except in the case of carcinoma, in which there was slight papilledema. The differentiation between tumor and syphilitic arachnoiditis was not difficult in these cases, because in all but one a negative history for syphilis was presented and in none was there a positive serologic reaction. The diagnosis of tumor was further supported in 5 cases by roentgen examination, in which were revealed definite pathologic changes in the sella turcica—marked enlargement of the sella or erosion of the clinoid processes or both. In none was there any evidence of calcification.

In only 1 case was there a possible background of syphilis; it pertained to the history of a "penile sore" seventeen years before, for which the patient had received treatment. On his admission to the hospital the Wassermann and Kahn reactions of the blood were negative. The Wassermann reaction of the cerebrospinal fluid and the colloidal gold reaction were also negative. This patient had bitemporal hemianopia, progressive loss of vision with primary atrophy of the optic nerve and a history of drowsiness, diminished libido and polyuria. Roentgen examination revealed a normal sella turcica and no suprasellar calcified deposits. In order to save the patient's vision, an operation was performed; a large suprasellar cyst was exposed and tapped, and 20 cc. of chocolate-colored fluid was removed. This case adds to the evidence that when a chiasmal syndrome is associated with negative serologic reactions an expanding lesion must be ruled out, despite a suggestive history of syphilis. It is in contrast to the following case reported by Cushing,<sup>1a</sup> in his classic description of the chiasmal syndrome.

A man aged 39 had slowly progressive failure of vision for three years, atrophy of the optic nerve, bitemporal field defects and large central scotomas and a history of a possible juvenile syphilitic infection, which had not been treated. The Wassermann reaction of the blood was negative, but the Wassermann and Kahn reactions of the cerebrospinal fluid were slightly positive. After a brief but vigorous antisyphilitic regimen these reactions became negative. "Meanwhile the patient's



sight had progressively failed, and in the hope that the symptoms might after all be due to tumor, an exploratory operation was advised." No tumor was observed. However, the chiasm was enveloped in a "distinctly thickened and grayish arachnoid containing a great excess of fluid," constituting the chiasmal cistern. The fluid was evacuated, but there was no improvement in sight after the operation—a fact which was difficult to explain. The relation to a possible syphilitic infection in this case and in similar cases in his series, Cushing stated, remained obscure. However, the case stresses the significance of a positive Wassermann reaction in association with the chiasmal syndrome and the need for bearing arachnoiditis in mind in such instances.

The number of instances of the chiasmal syndrome in the series of cases of combined tumor of the brain and syphilis totaled 12; in 7 the syndrome was produced by an expanding lesion and in 4, by syphilitic arachnoiditis around the chiasm; in 1 instance the cause was doubtful. In one fourth of the cases in this small series the condition was due to syphilis. This relatively high incidence stresses the need for keeping this factor in mind when the etiologic differentiation of chiasmal lesions is under consideration.

*Incidence of Primary Atrophy of the Optic Nerve.*—The incidence is high in cases of the chiasmal syndrome, whether it is due to tumor or to syphilis. It occurs rarely in association with expanding lesions of other parts of the brain. Atrophy of the optic nerve was noted in 9 of the cases of tumor of the brain, of which 6 were instances of hypophysial lesion which produced either unilateral or bilateral atrophy of the optic nerve. In 2 cases there was homolateral atrophy of the optic nerve associated with contralateral choked disk, a syndrome described by Kennedy<sup>6</sup> as characteristic of lesions of the frontal lobe and meningioma of the olfactory groove, in which atrophy is due to pressure on the optic nerve on the same side. Atrophy of the optic nerve was present in 1 case of tumor of the cerebral hemisphere and could not be explained by the site of the lesion. It is also well to note that a diffuse basilar neoplasm of the meninges may extend forward sufficiently to implicate the optic nerves and chiasm; in such a case the atrophy of the optic nerve is associated with lesions of other cranial nerves.

The total number of instances of primary atrophy of the optic nerve in the series of cases of combined tumor and syphilis was 12. In 3 of this number the atrophy was due to syphilitic arachnoiditis, the incidence of syphilis thus being 25 per cent. The syphilitic optic atrophies have been thoroughly reviewed in an excellent monograph by Moore.<sup>7</sup> If one bears in mind that primary atrophy of the optic nerve is the most frequent type of optic neuropathy due to syphilis and that the parenchymatous forms of the disease, which are responsible for a

6. Kennedy, Foster: Retrobulbar Neuritis as an Exact Diagnostic Sign of Certain Tumors and Abscesses in the Frontal Lobes, *Am. J. M. Sc.* **142**:355, 1911.

7. Moore, Joseph E.: The Syphilitic Optic Atrophies, *Medicine* **11**:263, 1932.

large percentage of the cases, were not included in this study, the incidence of 25 per cent in our series is not unusual. If one allows for this difference, the figure compares favorably with the statistics of Woods and Rowland,<sup>8</sup> which indicated that in 41 per cent of the instances primary atrophy of the optic nerve is due to syphilis. Woods and Rowland based their figures on a study of 137 patients hospitalized in the wards of the Wilmer Ophthalmological Institute and noted that 20 of 48 patients with primary atrophy of the optic nerve, or 41 per cent, suffered from syphilis of the central nervous system. Moore expressed the belief that this form of optic neuropathy is most frequently associated with the parenchymatous forms of the disease, especially tabes dorsalis. This relationship assumes great significance in the light of the statistical survey of Usilton,<sup>9</sup> based on surveys directed by the United States Public Health Service. At least 10 per cent of the population, of different age groups, is infected with syphilis. It is estimated that there are about 423,000 cases of new infection with syphilis each year and that there may at one time be about 500,000 persons with tabes in the United States; from 10 to 14 per cent of the latter group may acquire atrophy of the optic nerve, so that 50,000 cases of this type are usually present. This figure, however, may be misleading. Although primary atrophy of the optic nerve often appears as the earliest manifestation of tabes, before the signs of involvement of the dorsal column, it is not safe to assume that the association of syphilis with primary atrophy of the optic nerve alone, with no other neurologic signs, denotes tabes. The term itself—tabes dorsalis—implies the wasting of the dorsal columns so essential to the diagnosis, all other things being equal. Such wasting, of course, may occur in other conditions—multiple sclerosis, subacute combined sclerosis and diabetes. Once syphilis is established as the etiologic agent, however, the diagnosis of tabes is readily supported by the clinical and pathologic evolution of the disease. However, without the signs of involvement of the dorsal column and dorsal root, with the characteristic pains and impairment of deep sensibility and loss of deep reflexes, the diagnosis of tabes should not be made with certainty; to do so, as Moore did, or to suggest that all patients with syphilitic primary atrophy of the optic nerve have tabes (Hawthorne<sup>10</sup>) is unwarranted and violates the classic tenets of neurology. In the light of such a clinical fallacy it is not surprising to find a report of "tabes dorsalis with primary atrophy of the optic nerve presenting the symptom of binasal hemianopsia" (Drake<sup>11</sup>).

8. Woods, A. C., and Rowland, W. M.: An Etiologic Study of a Series of Optic Neuropathies, *J. A. M. A.* **97**:375 (Aug. 8) 1931; cited by Moore.<sup>7</sup>

9. Usilton, L. J.: *Ven. Dis. Inform.* **11**:543, 1930; cited by Moore.<sup>7</sup>

10. Hawthorne, C. O.: *Brit. M. J.* **2**:1153, 1922; cited by Moore.<sup>7</sup>

11. Drake, Ralph L.: Ocular Syphilis: V. Binasal Hemianopia Associated with Primary Optic Atrophy in Tabes Dorsalis, *Arch. Ophth.* **12**:583 (Oct.) 1934.

It misled Igersheimer<sup>12</sup> to postulate that the hemianopias, binasal and bitemporal, associated with "tabes" may be only pseudohemianopias due to symmetrical defects in the peripheral fields. The diagnosis of tabes in such cases should be accepted with great reservation, particularly if there are no signs of involvement of the dorsal roots or dorsal column and if the visual field defects are anatomically referable to the optic chiasm. A lingering suspicion of syphilitic basilar arachnoiditis should always be present in such cases, for basilar arachnoiditis, whether syphilitic or not, is probably much more frequent than is generally supposed. This conviction is supported not only by the group of cases reported in this paper but by cases of nonsyphilitic primary atrophy of the optic nerve in which exploration was made for a possible hypophyseal lesion and which have been found on the operating table to be cases of chronic cisternal arachnoiditis, as reported by Heuer<sup>2a</sup> and others.<sup>2b, c</sup> Heuer encountered the chronic nonsyphilitic type four times in a series of 17 explorations of the chiasmal region for possible neoplasm. In all these cases marked loss of vision (blindness in 1 instance) was associated with primary atrophy of the optic nerve (in 1 case there was slight papilledema). In 2 instances there were temporal field defects, and in 2, a more or less concentric constriction of the fields of vision. At operation chronic cisternal arachnoiditis with adhesions about the optic nerves was observed in these cases. In 3 of the 4 cases there was, in addition to the condition described about the chiasm, thickening of the pia-arachnoid, with an excess of cerebrospinal fluid over the frontal and the temporal lobe exposed in the approach to the chiasm, so that the chronic cisternal arachnoiditis appeared to be only part of a more or less general condition. Heuer stated:

A whole series of lesions about the chiasm, unsuspected 20 years ago, has come within the knowledge of the neurologic surgeon, and their symptomatology, clinical signs, and x-ray manifestation have come to be better understood. The ophthalmologist should make himself familiar with these lesions for to him perhaps the majority of patients harboring them first come.

Heuer's experience with this condition at the operating table has been confirmed by others (Frazier,<sup>2b</sup> Davis and Haven<sup>2c</sup> and Puech, David and Brun<sup>2e</sup>). The nonsyphilitic form of basal arachnoiditis is simulated closely by the syphilitic form, both clinically and grossly, at the operating table.

Wilbrand and Sanger,<sup>13</sup> in their section on diseases of the optic chiasm, devoted sixteen pages to a consideration of syphilis of this region and stated that the chiasm has a predilection for the gummatous form of meningitis. This coincidence is not surprising, for, as Kennedy observed, syphilis has a tendency to settle in the crevices and folds of

12. Igersheimer, J., cited by Moore.<sup>7</sup>

13. Wilbrand, H., and Sanger, A.: *Die Erkrankungen des Chiasmas*, in *Die Neurologie des Auges*, Weisbaden, J. F. Bergmann, 1915, vol. 6, pp. 1-263.

the central nervous system, as reported by Friedman, Brock and Denker.<sup>14</sup>

It behooves one to be cautious before dismissing the hemianopic defects associated with syphilis as pure accidents of tabes. For that reason, Drake's study<sup>11</sup> may be open to question. As Drake pointed out, the occurrence of binasal hemianopia from any cause is rare.

Mooren saw only 5 cases of binasal form in 125,000 patients with ocular conditions. Schweigger found 1 binasal defect in 39 cases of hemianopsia.

Drake reviewed 6 cases reported in the literature as instances of binasal hemianopia associated with tabes. In only 1 case, which was characteristically an example of tabes, was autopsy performed. Degeneration of both optic nerves was shown. However, since in the other cases autopsy was not performed, the underlying anatomic defect must still remain obscure. In case 4 of our series binasal hemianopia was presented without signs of tabes or positive serologic reactions. Drake, in his review, described an additional case, typical of tabes, in which visual acuity decreased rapidly despite intensive therapy, which included the intravenous administration of potassium iodide, bismuth, neosarsphenamine and sodium iodide and the Swift-Ellis treatments every other week for thirteen months.

Drake also referred to 5 cases of bitemporal hemianopia associated with tabes reported by Fuchs and 6 cases of horizontal homonymous hemianopia associated with tabes reported by Zimmermann. In these cases the diagnosis must be accepted with doubt and must remain open to the suspicion of syphilitic arachnoiditis around the chiasm. To attribute the field defects in these cases to a selective process within the optic nerves, involving only certain fibers and sparing others, is too far fetched.

It is of unusual interest to note here that binasal hemianopia may also be produced by a suprasellar tumor. The mechanism of the production of this type of visual field defect was discussed by Fay and Grant,<sup>15</sup> who reported the case of a man in whom a suprasellar tumor lying in the interpeduncular space just posterior to the chiasm had pressed the latter structure forward in such manner that both optic tracts had become notched by the carotid arteries.

Moore stated:

The great rarity of hemianopsias in tabetic atrophies is a strong argument in favor of the fact that the primary pathologic lesion is in the optic nerve anterior to the chiasm.

14. Friedman, E. D.; Brock, Samuel, and Denker, Peter G.: Syphilis of the Cerebellopontine Angle, *Am. J. Syph.* **17**:330, 1933.

15. Fay, T., and Grant, F. C.: Lesions of the Optic Chiasm and Tracts with Relation to the Adjacent Vascular Structures, *Arch. Neurol. & Psychiat.* **9**:739 (June) 1923.

First, the question to be answered is how often the visual fields are examined as a routine in cases of tabes. Second, in how many of these cases is the condition true tabes? Furthermore, the presence of concentric constriction of the visual fields, which is characteristic of tabes, may also occur in cases of arachnoiditis. Heuer showed in his series that the fields may be constricted concentrically and not hemianopically in some cases, owing to involvement of the optic nerve itself by adhesions. He observed that chronic cisternal arachnoiditis, like a tumor in this region, gives rise to visual disturbances of varying severity, primary atrophy of the optic nerve and hemianopic field defects, but not necessarily to hemianopia. He referred to cases in which there occurred:

Thickening of the pia arachnoid around the optic nerves at their junction with the chiasm and extending forward to the optic foramina. The nerves seem embedded in, and strangulated by, a mass of adhesions as is seen sometimes in arachnoiditis involving the spinal cord. Under these conditions there is, instead of bitemporal field defects, a more or less concentric constriction of the fields of vision.

These observations were also duplicated in our series.

A tumor in this region may also give the same concentric field defect. Dandy,<sup>4</sup> in his cases of prechiasmal intracranial tumor of the optic nerve surrounding the optic nerve at the optic foramen, noted that the visual field defects in these cases show concentric constriction rather than a form of hemianopia and that the visual disturbances are produced by direct pressure on the optic nerve rather than by implication of the chiasm.

The deduction to be made from these observations is that concentric constriction of the visual fields in the presence of syphilis and primary atrophy of the optic nerve does not necessarily denote tabes. It is agreed, as Moore pointed out, that this contraction of the peripheral fields in cases of true tabes is in keeping with the pathologic process, which begins in the marginal fibers of the optic nerve distal to the chiasm. However, adhesions around the optic nerves may give fields of the same peripheral type. The differentiation depends on the color fields, scotomas, etc. Even so, the presence of bitemporal field defects in such cases should suggest the added possibility of arachnoiditis about the chiasm.

The cause of atrophy of the optic nerve in association with syphilitic arachnoiditis is still undetermined. Moore expressed the belief that it may be due to direct pressure of the syphilitic inflammatory tissue on the optic conduction pathways, resulting in secondary nutritional disturbance of these parts. The pressure may be exerted locally on the optic nerve within the orbit, either by a gumma or by periostitis, or anywhere along the optic nerve, optic chiasm or optic tract.

Full consideration of the causes of the syphilitic optic atrophies, which have been covered by Moore,<sup>7</sup> is not intended in this paper.



The etiology would include a large number of factors due to hereditary and acquired diseases of the central nervous system. The classic example of acquired disease is tabes dorsalis, with the characteristic early and rapid diminution in the red and green fields, the concentric contraction of the form fields and the yellow and blue fields and the occurrence of central scotomas. Of the hereditary forms of atrophy of the optic nerve, the one of special interest to this discussion is, strangely, Leber's disease. It is generally accepted that this form of hereditary primary atrophy of the optic nerve appears before the age of 20 years and that it is slowly progressive, is more common in males and is transmitted by females. I recently had the opportunity of observing this condition in 2 sisters, aged 21 and 12 years, respectively, in the clinic of Dr. H. Wolff at the New York Hospital. The older sister had complained of poor vision since the age of 6 years, when she started school. She did not think that her vision in the past fifteen years had become better or worse. She presented bilateral atrophy of the optic nerve, with normal peripheral fields with a 10 mm. disk; central color vision was present only with the larger disks. In the right eye there was a partial central scotoma for form and for color with a 1.5 mm. disk. Roentgenography of the skull, including the sella, revealed normal structure. The sister, aged 12 years, likewise had poor vision and presented bilateral atrophy of the optic nerve, with no gross field defects. The occurrence of this disease in females was noted as unusual. It is considered in this paper because of the pathologic changes in the arachnoid observed in a study by Davis and Haven,<sup>20</sup> in which they reported a case of primary atrophy of the optic nerve in a man aged 25 with a definite history of heredity; a brother had a similar loss of vision at the same age, and a maternal uncle (and possibly three others) had similar visual disturbances. The patient showed a defect in the visual fields, with absolute central scotomas. An osteoplastic craniotomy exposed the chiasm. Fluid was emptied from about the chiasm, but this was not large in amount. The right optic nerve was not enlarged or injected.

There was, however, a distinct thickening of the arachnoid membrane about the nerve and a number of arachnoidal adhesions to the nerve. . . . The left nerve was similarly normal in size and was not injected. It was quite adherent, however, to the under surface of the frontal lobe from which it was freed. The pituitary gland was normal in color and size.

Before operation vision was 7/200 in the right eye and 1/200 in the left. The third day after operation the patient insisted that his vision was markedly improved. Six days after operation the acuity was 20/200 in the right eye and 3/200 in the left. Four weeks after the operation it was 20/60 in the right eye and 2/200 in the left. There

were no longer any central scotomas, and in the left eye the patient was able to see a 1 mm. fixation object in all parts of the field. Davis and Haven concluded:

It was felt that this case is similar to many others of arachnoiditis of the chiasmal cistern except that there was a familial history. This would seem to relate it to that group of cases described by Leber, and known as Leber's disease or heredo-familial optic atrophy. No other similar case to our knowledge has as yet come to operation. The marked improvement so far obtained in this case would tend to vitiate a diagnosis of Leber's disease, in which the etiology is supposedly an atrophy of the ganglion cells of the retina. Whether the arachnoidal pathology noted in this case played a part in the etiology of such a condition we are unable to state. It was, however, not the same gross picture encountered in other cases which had a large collection of fluid about the chiasm.

Davis and Haven reported another case, pertinent to this discussion, of a woman aged 23, with loss of vision and primary atrophy of the optic nerve and unequal pupils, which reacted in accommodation but not to light. Operation disclosed an enormously dilated chiasmal cistern. The right optic nerve was injected and somewhat smaller than normal. "The arachnoid surrounding the nerves and chiasm was grey and translucent and appeared to be as thick as an infant's dura mater." Vision began to improve within a few days. The patient was seen again, eleven months after the operation, and continued to show improvement. She was then working as a stenographer, without visual difficulty.

*Incidence of Pleocytosis in the Spinal Fluid in Cases of Tumor of the Brain and Its Significance in Relation to Syphilitic Arachnoiditis.*—An increase in the number of cells in the spinal fluid frequently raises the question of an infectious process. In case 1 in the series of syphilitic arachnoiditis there were 20 cells in the spinal fluid, and in case 5, 110 cells, in the terminal stage of the disease. Syphilis was established by serologic examination in each instance. In only 3 of the 76 cases in the series of tumors of the brain was there pleocytosis; in 1 case, that of an astrocytoma of the right temporal lobe, there was a strongly positive Wassermann reaction of the blood and the spinal fluid; the spinal fluid was xanthochromic; there were an abnormal colloidal gold curve (4444433311) and 125 cells, most of which were lymphocytes. The presence of tumor was suggested by marked papilledema, with hemorrhages and localizing neurologic signs; it was confirmed by ventriculography. In 2 of the 3 cases no evidence of syphilis was revealed; the spinal fluid was xanthochromic in both and contained 24 and 700 cells, respectively. The higher count occurred in a case of angioma of the pituitary gland, which apparently was bleeding; the spinal fluid was yellowish pink and contained 700 cells, 96 per cent of which were

polymorphonuclears. The patient gave a history of sudden blindness in the right eye the day before admission to the hospital and in the left eye two days before, in association with acute ptosis. Four days before he had had an acute and violent headache. He had a high temperature and signs of meningeal involvement. The course was rapidly downward; autopsy disclosed an angioma of the pituitary gland, which looked much like an aneurysm filled with blood clot and compressed the optic chiasm. It was described by Dr. Lewis Stevenson as an "angiomatous tumor of the pituitary gland, on the surface of which there were remnants of pituitary cells." In such cases of acute lesion of the optic chiasm and its vicinity, aneurysm of the circle of Willis and traumatic lesions must also be kept in mind (Traquair, Dott and Russell<sup>16</sup>).

The xanthochromic spinal fluid in these 3 cases points to bleeding within or from the tumor sufficient to discolor the fluid and cause an increase in the number of cells. The clinical picture in each case was clearly that of tumor of the brain. The infectious nature of the condition was indicated by roentgenography of the spine and by inoculation of guinea-pigs. Clinically there was advanced bilateral papilledema (from 3 to 4 diopters), with marked dilatation of the ventricles and signs of meningeal involvement. Tumor was suspected, but exploration gave negative results. The papilledema was due to internal hydrocephalus, the result of obliteration of the foramina of Luschka and Magendie; this observation emphasizes the significance of the optic swelling in case 5, in which, however, there was no internal hydrocephalus.

In a case (not included in this series) in which tumor of the brain was suspected but in which the condition proved to be tuberculous basilar meningitis, 23 cells were shown in the spinal fluid.

*Incidence and Significance of an Abnormal Gold Curve in Cases of Tumor of the Brain.*—The colloidal gold reaction was abnormal in 4 cases of the series of tumors of the brain. In 1 case it was 0000123321, with a negative history of syphilis and negative serologic reactions. The diagnosis of tumor was readily made. In another (case 5, already cited) the colloidal gold curve was 1122321000, and the Wassermann reaction of the blood and of the spinal fluid was strongly positive. Examination of the brain disclosed a gumma in one hemisphere and basal syphilitic meningitis. In a third case the curve on two occasions was 0112211000 and 3333210000, respectively, with the Wassermann reaction of the blood 4 plus and that of the spinal fluid negative. In this case a gumma of the meninges was present over the

16. Traquair, H. M.; Dott, N., and Russell, W. R.: Traumatic Lesions of the Optic Chiasm, *Brain* 58:398, 1935.

parieto-occipital region. In a fourth case (that of astrocytoma of the temporal lobe already cited) the curve was 4444433321, and the Wassermann reaction of the blood and of the spinal fluid was strongly positive. Thus, in 3 of the 4 cases in which the gold curve was abnormal the reactions for syphilis were strongly positive; in 2 instances there was a gumma and in 1, an astrocytoma. In cases 1 and 5 of the series of syphilitic arachnoiditis, the gold curve was abnormal. Case 5 has also been included in the series of tumors of the brain. In case 1 the colloidal gold test gave a reading of 0011221100; the Wassermann reaction of the spinal fluid was negative but that of the blood was 4 plus. It is evident that the colloidal gold curve must be interpreted in terms of the whole clinical setting.

#### TREATMENT

These cases of syphilitic arachnoiditis provide an opportunity for weighing the relative merits of different types of treatment when blindness is imminent. Once the condition of basal syphilitic meningitis around the chiasm is established and the question of saving the eyesight becomes paramount, the physician is confronted with a choice of two methods: (1) vigorous antisyphilitic medication or (2) surgical intervention designed to cut the adhesions at the base and thus liberate the chiasm and the optic nerves. In this series of 5 patients 4 were treated vigorously with arsphenamine and mercury, without any noticeable improvement either in the visual acuity or the field defects; 1 was given the benefit of surgical treatment.

In cases 2, 3, 4 and 5, in which there was conservative treatment with arsphenamine and mercury, no impression was made on the visual acuity or the field defects, except for slight improvement in case 4, in which the etiology was uncertain. One patient, who had been given the benefit of malarial fever therapy before his admission, failed to show any noticeable visual improvement; on the contrary, vision became progressively worse. Tryparsamide is definitely contraindicated when atrophy of the optic nerve is present. The best result to date was obtained in case 1 through surgical intervention, in which adhesions were freed around the chiasm. The improvement in vision after operation in this case was rapid and striking, a result which parallels the experience of others in the surgical treatment of chronic chiasmal arachnoiditis of nonsyphilitic origin. Heuer found that in his series of 4 patients on whom operation was performed there was remarkable improvement in vision. One had not been under observation sufficiently long for the report of later results. One of 3 other patients had satisfactory vision and was following his usual work three years after operation, without any signs of recurrence of the condition; 1 could

read the finest print and was doing her usual work as a nurse one year after operation, and 1, previously completely blind, could with glasses read the finest print and was without symptoms of recurrence of the condition six months after operation. These good results are encouraging. Reference has already been made to similar reports by Davis and Haven.

To what the beneficial effect on vision is due is difficult to say. In the series of cases of syphilitic arachnoiditis the benefit apparently was not due to elimination of the syphilitic or other toxic agent, for that factor was still present and was not removed by operation. The probability is that liberation of the chiasm and optic nerves from adhesions improves the blood supply to these parts and thus helps to restore the nutrition and the function of this portion of the visual apparatus.

Surgical intervention should be instituted only when antisyphilitic treatment has failed to arrest the progressive diminution of vision. Whenever possible, one prefers conservative measures, but if they have failed and the condition is rapidly approaching blindness, there may be little choice; the ultimate decision between the risk of operation and the despair of blindness may be left to the patient.

In the hands of a skilful surgeon the risk of surgical intervention is worth taking. Cushing stated:

Through the perfection of neurosurgical technique, the heretofore largely inaccessible region of the chiasm has come of late years to be one frequently and readily exposed to view.

#### SUMMARY AND CONCLUSIONS

The neurologic findings in the 5 cases of syphilitic chiasmal arachnoiditis submitted for consideration are summarized in the résumé of the cases on page 943. The cases were grouped according to the clinical setting and were studied for purposes of differential diagnosis in terms of a series of 76 cases of verified tumor of the brain, which were analyzed with reference to significant clinical and laboratory data presented by the group of cases of arachnoiditis. The conclusions are as follows:

1. The syndrome of syphilitic chiasmal arachnoiditis may manifest itself clinically in one of two ways: (1) as the classic form of primary atrophy of the optic nerve, with heteronymous visual field defects, which occurred in cases 1, 2, 3 and 4, or (2) as the less frequent form of papilledema without internal hydrocephalus or increased intracranial pressure, which occurred in case 5.

2. The visual fields in cases of syphilitic arachnoiditis may show hemianopic defects or concentric constriction or both. Blindness may also occur in one or both eyes. The visual impairment resembles that



associated with chronic nonsyphilitic cisternal arachnoiditis and expanding lesions of the chiasmal region, and when it is associated with serologic evidence of syphilis, even if this is of the blood alone, there is a strong possibility that the underlying condition is syphilitic arachnoiditis of the chiasm. For that reason, the interpretation of the hemianopic visual field defects reported in the literature in questionable cases of tabes associated with atrophy of the optic nerve is open to question. The inclination in some quarters to regard the presence of primary atrophy of the optic nerve alone in cases of syphilis, without other neurologic signs, as evidence of tabes is contrary to all sound neurologic teaching. Many of these cases may belong to the group of syphilitic chiasmal arachnoiditis, which would account for the heteronymous peripheral field defects reported in cases of this condition.

3. Given the classic chiasmal syndrome of primary atrophy of the optic nerve with heteronymous visual field defects, the problem which arises is one not of localization (the chiasmal site of the lesion is evident) but of differential diagnosis, for the etiologic factor may be one of many: (a) an expanding lesion (tumor, cyst or aneurysm), which may be intrasellar, suprasellar or parasellar; (b) arachnoiditis (syphilitic or nonsyphilitic); (c) trauma, or (d) heredodegeneration. Syphilis as an etiologic factor should be carefully considered in each case. There were 12 instances of the chiasmal syndrome in the series of cases of combined syphilis and tumor. In 3 cases positive serologic reactions were shown, and in the remaining 7 the condition proved to be a neoplasm in or near the sella.

The problem of etiologic differentiation may become complicated when certain factors of neoplasm and syphilis exist together in the same case. If a positive Wassermann reaction, either of the blood or of the spinal fluid, is present with the clinical setting of neoplasm of the brain, the likelihood that a tumor other than gumma is associated with syphilis is exceedingly slight. When the factor of syphilis has been eliminated in cases of the chiasmal syndrome of primary atrophy of the optic nerve and visual field defects, the problem of differential diagnosis becomes more difficult, for it is not always possible to differentiate between nonsyphilitic chronic cisternal arachnoiditis and suprasellar tumor with normal roentgenographic findings in the skull. In many such instances of nonsyphilitic primary atrophy of the optic nerve in which exploration has been made for a possible hypophysial neoplasm, the condition has proved to be chronic cisternal arachnoiditis. The relation of hereditary atrophy of the optic nerve (Leber's disease) to chiasmal arachnoiditis is also discussed.

4. The nature of the pathologic process in syphilitic arachnoiditis is such that it compresses the optic nerves and chiasm. Why this local process around the chiasm should produce atrophy of the optic nerve in one instance and papilledema in another remains obscure. Reference is made to the dilatation of the chiasmal cistern described by others in cases of chronic cisternal arachnoiditis.

5. The chief problem which confronts both the patient and the physician is the prevention of blindness, which may develop within two years. The choice lies between vigorous antisyphilitic medication and surgical intervention to free the adhesions around the chiasm. The former gives little promise of relief; surgical treatment appears to be the method of choice, particularly when blindness is imminent.

## COLLOID CYST OF THE THIRD VENTRICLE

REPORT OF A CASE; OPERATIVE REMOVAL WITH SECTION OF  
POSTERIOR HALF OF CORPUS CALLOSUM

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AND

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The following case is noteworthy because of the unusual nature of the tumor and because of the interesting symptoms which followed operation. Since it was necessary to section the posterior half of the corpus callosum to remove the tumor, the postoperative disorders have a direct bearing on the problem of the callosal syndrome. The patient was a highly intelligent woman who was not in any way neurotic or given to exaggeration. It was possible to follow her case over a number of years, both before and after the operation, and an unusual opportunity was presented to study under the most favorable circumstances the interesting problems presented.

### REPORT OF CASE

*Paroxysmal headaches precipitated by flexion of the head and by stooping, later accompanied with vomiting, bradycardia and syncope. Colloid cyst of anterior part of third ventricle localized and removed successfully five years after onset of symptoms. Posterior half of corpus callosum sectioned at operation. Resulting loss of memory of topography and visual and tactile agnosia on left. Gradual improvement but not complete recovery in next four years.*

*History.*—M. S., a married woman aged 37, who was seen for the first time in October 1930, complained chiefly of headache. The onset of the symptoms occurred in December 1926, shortly after the birth of her third child. At that time she noticed that flexion of the neck and certain positions of the head caused a throbbing pain in the top of the head. At first the pain was not severe and lasted only a few minutes, but gradually the symptoms became worse. The pain would spread into the occiput and finally into the forehead. It was sharp and stabbing at the onset but after five or ten minutes would become a dull ache. The patient was conscious of some tension in the muscles of the neck at such times and was accustomed to throw the head back in an effort to relieve the pain. In 1929 the patient began to vomit during the more severe headaches. She was then having headaches almost every day, and the vomiting occurred on an average of once a month.

In the summer of 1930 an additional group of symptoms began to accompany the headaches. At the onset of a more severe attack the patient would become

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faint and her legs would grow weak, so that she actually fell to the floor on several occasions. She never lost consciousness but sometimes was slightly confused. She continued to have many mild and transient headaches, averaging at least one every day. The more severe attacks, associated with weakness and often with vomiting, occurred about once a week. The pain could be induced at will by flexing the neck or by stooping. Even if the patient corrected her position at once, the sharp pain would persist for several minutes, and the dull headache would last for hours. There was also likely to be some pain when she arose from a recumbent position, when she lay down, when she strained at stool, during sexual intercourse and during coughing and sneezing. Just before a menstrual period there was likely to be more headache than usual, and riding in an automobile would invariably cause a severe headache. The patient believed also that nervous strain and excessive use of the eyes, as in reading and sewing, induced headaches.

*Examination.*—Thorough study revealed no physical abnormalities of importance. The neurologic study revealed nothing to suggest an intracranial lesion. The psychiatric investigations showed that the patient's personality was normal. There was no evidence of a neurotic tendency. Ophthalmologic examination yielded little information. There was a moderate error of refraction, but the optic nerve heads were normal, vision was good and the visual fields were unaltered. Investigation of the nasal sinuses showed no abnormality. Roentgenograms of the skull were normal. All laboratory studies gave results within normal limits. The Wassermann test was negative. The basal metabolic rate was minus 16.

*Course.*—The patient was sent to a nursing home and was kept in bed for six weeks. During this time she had no headaches. The pulse rate varied between 60 and 90, with an average of 70. The blood pressure varied between 98 systolic and 60 diastolic and 120 systolic and 80 diastolic. As soon as she began to go about again the headaches returned, but not so severely as before. Small doses of thyroid and phenobarbital were prescribed. She was advised to reduce her activities and to rest part of each day.

Under this regimen she had few severe attacks until the summer of 1931, when they returned with increasing frequency and severity. Mild headaches occurred several times a day and severe attacks with vomiting and weakness at intervals of approximately one week.

Examinations once more revealed no abnormality. No evidence of increased intracranial pressure was discovered, and there was no sign of a focal cerebral lesion. The patient was observed during one of the more severe attacks, which developed without apparent cause when she was in the office. At first she complained of a sudden sharp pain in the back of the head. A few moments later she became pale and sank slowly to the floor in an unconscious condition. She was permitted to lie on the floor and was examined at once. The pulse could not be palpated at the wrist, and the blood pressure was too low to be estimated. The heart sounds were distant and feeble, and the rate was estimated at 60 per minute. Within about two minutes she began to regain consciousness, her color improved and the pulse could be felt at the wrist. The blood pressure was then 125 systolic and 80 diastolic and the pulse rate was 80 per minute. About a minute after the onset she vomited. The intense pain lasted for only a few minutes, but a dull headache persisted for two hours. No sweating, lacrimation, salivation or flushing was noted.

Despite the absence of objective findings, it was decided that the probabilities were in favor of a neoplasm of the brain, and the character of the attacks led to

the suggestion that the patient might have a small cyst of the third ventricle. The patient was referred to Dr. Dandy for ventriculography on Feb. 9, 1932.

*Ventriculography.*—The left ventricle was tapped, and fluid spurted under greatly increased pressure. More than 100 cc. of air was injected. The lateral ventricles were much dilated, and the air passed freely from one to the other. The third ventricle did not fill, and it was evident that the foramina of Monro were obstructed. A tumor lying in the anterior part of the third ventricle was diagnosed.

*Operation.*—Operation was performed by the occipital route. The corpus callosum was exposed, and the posterior half was divided by a midline incision. Only one small vein was ligated. The great vein of Galen was not injured. When the third ventricle was opened, a small whitish gray tumor was seen lying anteriorly between the foramina of Monro. This was attached to the choroid plexus. The cyst was punctured, and a clear gelatinous fluid escaped. The capsule was then removed. There was no bleeding. The cyst was perfectly round and about  $\frac{1}{2}$  inch (1.3 cm.) in diameter. It weighed 10.1 Gm. The wall of the cyst was composed of two layers: an outer fibrous coat and an inner layer of flat cuboidal epithelium, one or two cells thick. Some of these cells showed cilia. The cyst was filled with a homogeneous, tenacious colloid material.

*Postoperative Course.*—The patient regained consciousness without undue delay after the operation. For the first twelve days she was completely disoriented for time, place and person. She talked almost constantly during her waking hours in a rambling way. She imagined that she was on a boat part of the time and again spoke of riding on a truck. At times she talked of fictitious experiences, such as going to a party the preceding evening or of taking a ride in a car. There was a definite tendency toward euphoria, for she was always cheerful and laughed a great deal. These symptoms slowly diminished, and at the end of the second week the patient was oriented and the euphoria and confabulation had largely disappeared. At no time was there any paralysis or ataxia. Nothing was observed which was suggestive of aphasia or apraxia. The temperature was never over 101.6 F. and had fallen to 99.4 F. at the end of the fifth day.

The patient was discharged from the hospital on February 22, twelve days after the operation. She returned to her home, about 20 miles (32 kilometers) from Baltimore. One week later her husband wrote saying that she had shown definite signs of improvement but that it was evident that "her brain does not work right yet." More specifically, he said: "Her memory for persons is good, but memory for localities and events is bad." Two weeks after the patient returned home another letter from the husband stated that she was somewhat better but that "her sense of direction and recognition of localities is not good. When she goes for a walk or a short automobile ride she doesn't know which is her own house when she returns. All the houses on our line are alike and recognition depends upon location. She gets lost in our own house; goes the wrong direction to reach the stairs or bathroom or any other place she may be looking for. She doesn't recognize roads she should know. If she is driving alone, for instance, she gets lost very easily. She has fewer delusions than she had ten days ago." By delusions the husband referred to the tendency to confabulation, which had persisted to some extent.

Twenty days after the operation the patient returned for reexamination and was kept under observation at a nursing home for a number of days. A note made on March 28 reads as follows:

"The patient gave the impression of being in good physical condition. Her behavior was normal during examination, and she showed no signs of affective



disturbance or of intellectual deterioration. Her manner was natural, her answers were prompt and she cooperated excellently. Once or twice she laughed and even joked, but this was not inappropriate to the situation and did not suggest the foolish joking sometimes observed in cases of cerebral disease.

"The visual fields were first tested. The outlines of the fields on the right were normal, but on the left the patient sometimes failed to notice the test object. She would be conscious of something to her left but would not recognize it. After many tests it was determined that the outlines of the left fields were normal and that the color fields were unaltered but that the patient's powers of attention were diminished and that she could not recognize objects on that side. For example, when a large wooden letter was held just to the right of the fixation point, she always recognized it, but when it was held on the left, she had no idea of its nature. However, she could touch objects in the left fields accurately. There seemed to be no real difficulty in naming objects fixed in central vision, for she named ten familiar objects without error in rapid succession. She could read and write fluently and understood what she had read.

"The patient's eyes fixed objects quickly, followed the examiner's fingers well and converged well. She could recognize the relative position of objects in space and could estimate relative and absolute distances with reasonable accuracy. With her eyes closed she could not point in the direction of her bureau, fireplace, washstand, vase of flowers, door, screen or window. She could not draw a correct diagram of her room and the bathroom, which were side by side, but showed the bathroom on the wrong side of the hall and in wrong relation to her room. She could count small objects scattered over her bed and could recognize the longer of two lines. A test made with wooden letters showed complete astereognosis in the left hand. She failed six times in succession but made no errors with her right hand. However, she could recognize without difficulty pencils, keys, scissors and other familiar objects held in the left hand. The sense of passive movement of the fingers of the left hand was not diminished, and she made no errors in finding her left forefinger with her right forefinger. Her two point sense was accurate.

"No evidence of motor apraxia was discovered. The patient showed with her left hand the proper motions to comb hair, brush teeth, wave good-bye, wind a victrola, turn a key, etc., without error."

Three months after the operation, the nurse who had returned home with the patient wrote saying: "Her general condition is good. Her sense of direction is not good, but it has improved. She often turns left when she should turn right. When she is on the golf course she often starts in the wrong direction for the next tee. The same is true when she starts home. If she goes to her room, she sometimes turns left instead of right and enters her son's room, which she recognizes when she enters it."

Six months after the operation the patient was leading her former life and was able to play golf well enough to be "runner-up" in a tournament. She still had great difficulty in finding her way around on the links, however. When she went to Baltimore to shop, as she had done for a number of years, she was unable to find the stores she was accustomed to patronize. She found it necessary to travel entirely by taxicabs. She was able to look after her household duties just as before the operation. Her friends and family noticed no change in her behavior. The euphoria and the tendency to confabulation had disappeared long before. The patient and her husband have answered inquiries about her condition from time to time, and there have been occasional interviews with the

patient. The patient takes care of her children and manages her household duties without difficulty. There has been no alteration of her social life or diminution of her popularity among her friends. For a few months after the operation she was somewhat irritable and was likely to be disturbed when the children were noisy. This did not continue, however. She has not been depressed, elated or euphoric. Her interests and intelligence have suffered no reduction, according to her husband. Her memory has not been affected. Her husband has watched the progress of the symptoms carefully. His last letter, received more than four years after the operation, stated that "she has not completely recovered her sense of direction but almost so;" that "there is little or no difficulty in noticing objects on her left" and that "she has no difficulty in recognizing objects placed in her left hand, although she could not, I think, recognize letters of the alphabet in that hand." Evidently all the original symptoms are still present, although they have become less severe year by year.

#### COMMENT

This case presents two problems of great interest: the symptoms due to the colloid cyst of the third ventricle and the postoperative symptoms, which we shall attempt to show were the result of operative section of the posterior half of the corpus callosum.

*Symptoms of the Colloid Cyst.*—In 1933 Dandy was able to find thirty-one case reports of colloid cyst of the third ventricle, to which he added five cases of his own. During the same year Zimmerman and German reported two cases of a similar nature, and in 1935 Davidoff and Dyke published a report of seven additional cases. Riddoch has reported another case recently. Such a cyst is not, therefore, excessively rare. It is always completely encapsulated by a fibrous wall and lined with a layer of epithelium, which usually shows definite cilia. It contains a thick, tenacious colloid material of yellow, brown or greenish color. Concretions may be found within the cyst. It is of interest that the cyst always occurs in exactly the same situation, namely, in the anterior part of the third ventricle just under the fornix and between the foramina of Monro. The restriction to this locality lends support to the theory of Sjövall that it arises from remnants of the paraphysis. At present this view seems to be generally accepted. One gains the impression that such a cyst is of congenital origin and that it grows slowly. The brain is never invaded, and the symptoms must therefore be due to obstruction of the third ventricle and to pressure on structures adjacent to the ventricle.

The onset of symptoms may occur at any age, but most frequently they are first noted when the patient is between the ages of 20 and 40 years. There is no significant difference in the incidence in the two sexes. In some cases death has occurred within a few months after the onset, but in other cases the course has been of many years' duration, and one patient is known to have survived for twenty years.

The first symptom is almost invariably headache, but in some instances mental changes have preceded the headache, and headache may be absent. The pain is most frequently located in the frontal or occipital region and is almost always bilateral. A striking and characteristic feature in many cases is the paroxysmal nature of the headaches, which are sometimes associated with other transient symptoms. It is mentioned repeatedly in typical case histories that the patient could induce headache by assuming certain positions or by making certain movements. Flexing the head, stooping, turning the head to either side, assuming an upright position and numerous other movements are mentioned among the means of inducing headache. In the same way it is frequently stated that extension of the neck gave some relief. Our patient never had headache when lying in bed. Coughing, sneezing, straining at stool and sexual intercourse will frequently induce headache. During the course of a more severe headache, vomiting and diplopia frequently occur. A few patients have described scintillating scotomas during attacks of headache. Changes in blood pressure, usually a sudden drop of pressure, slowing of the pulse, flushing of the face and syncope also are common. Generalized convulsive seizures have been observed several times, but we have been unable to discover a complete description of an attack. One gains the impression that the seizures are usually tonic fits. As a rule, these symptoms last only a few minutes, although the headache may last several hours. In certain instances the patient has remained in a state of stupor or coma for many hours or even a day. Death may occur suddenly in a seizure. In some cases the headache is constant from the beginning, but more frequently it is paroxysmal throughout the course. The headache may be paroxysmal at first and become constant later. It is of great interest that prolonged remissions may occur. In one case the symptoms were absent for nine years and in another for eleven years. McLean has suggested that these remissions may be due to reduction of the size of the cyst as a result of leakage of its contents.

There has been much discussion of the cause of the sudden attacks of headache. Such attacks are frequently observed in cases of tumor of the fourth and lateral ventricles, as well as in cases of tumor of the third ventricle. In fact, a neoplasm within the cerebellum may cause exactly the same phenomena, so that these paroxysmal headaches are not specific signs of an intraventricular tumor. It is generally agreed that they are due to a sudden increase in the intracranial pressure as a result of a valvelike action of the tumor, which causes intermittent obstruction of the ventricular system. Just how flexing the neck, stooping and coughing are effective in causing this obstruction is not entirely

clear. Perhaps these movements favor displacement of the cyst anteriorly, where it is favorably situated to block the foramina of Monro. It may be significant that extending the head and lying flat in bed give relief to the headache. Perhaps these postures displace the cyst posteriorly and prevent obstruction of the foramina. It may seem difficult to understand why the headache may develop so promptly after certain movements, but the explanation is to be sought in the physical properties of the cranium, which behaves, as Weed has shown, like a "closed box." The cerebrospinal fluid is continuously secreted, and the moment drainage is obstructed the intracranial pressure rises enormously, since the cranial walls have no elasticity.

Neurologic examination usually reveals only signs of increased intracranial pressure. In most cases papilledema develops eventually and is followed by atrophy of the optic nerve and loss of vision, but papilledema may be absent for many years. Paresis of one or both sixth nerves may occur in the same way. Numerous other findings are described by various writers, but these are frequently indefinite and difficult to interpret correctly. Slight differences in the tendon reflexes on the two sides are mentioned, but definite hemiplegia or even hemiparesis does not seem to occur.

In several cases it has been stated that there was weakness of the legs during the paroxysmal attacks, but whether this is to be regarded as evidence of pressure on the motor tracts, as many authors have seemed to believe, or as a manifestation of approaching syncope is uncertain. Apparently, there is no significant ataxia. The station and gait are frequently unsteady, but this is probably merely a manifestation of increased intracranial pressure. Some authors have mentioned slight differences in the pupils, but the paralysis of upward associated movements of the eyes and the loss of pupillary reflexes which are such characteristic signs of a tumor in the posterior part of the third ventricle or in the anterior part of the midbrain are not observed in cases of colloid cyst. There is usually no evidence of involvement of the infundibulum or the floor of the third ventricle, for polyuria, polydipsia, obesity, glycosuria, neurogenic fever and true somnolence are rarely mentioned. In two cases there was said to have been definite polyuria and obesity, however. Bitemporal hemianopia, which is typical of a suprasellar tumor, does not occur. The cyst is so situated that it exerts direct pressure on the anterior and mesial parts of the optic thalami. In several cases there have been paresthesias and even sharp pains in the extremities, not only during the paroxysmal attacks but during intervals between the attacks; but these have not been so frequent that they may be regarded as characteristic. The complete thalamic syndrome

is not described. Mental symptoms, such as apathy, loss of memory and changes in personality, are frequently mentioned. These are probably merely a result of hydrocephalus. Roentgenograms of the skull show only the effects of increased intracranial pressure. Ventriculography reveals dilatation of the lateral ventricles, but no air passes into the third ventricle, for the foramina of Monro are occluded. Sometimes air will pass from one lateral ventricle to the other, for the septum pellucidum may be ruptured by the hydrocephalus.

In summary, we may say that the most constant evidences of colloid cyst of the third ventricle are merely those of increased intracranial pressure. The headaches are frequently paroxysmal and induced by changes of posture, especially by stooping and by flexing the neck. Such headaches may be associated with flushing of the face, a fall in blood pressure, vomiting, vertigo and syncope. Tonic fits may occur. There are few, if any, typical objective findings. Signs found in cases of tumor of the posterior or inferior part of the third ventricle are usually absent. Papilledema is usually present early in the course but may be absent for many years. In the case reported by Riddoch there was no headache or papilledema, and the only manifestation of hydrocephalus was progressive dementia during a period of twelve years. The symptoms may begin at any age but occur most frequently between 20 and 40 years. The location of the tumor may be suspected on clinical grounds, but definite localization is scarcely possible without ventriculography.

*Postoperative Symptoms.*—The corpus callosum is regarded as a great commissure connecting the cortices of the cerebral hemispheres. Its bulk is vastly greater than that of all the other commissural structures combined. In the animal series the development of the corpus callosum seems to parallel that of the cerebral hemispheres, being greatest in man. The work of Mingazzini and of many others has shown that the corpus callosum connects chiefly homologous areas of the cortex, but it connects heterologous areas also to some extent. Thus, the genu unites the frontal lobes; the body of the callosum connects the precentral gyri, the paracentral lobules, the parietal and temporal lobes and the insulae, and the posterior third unites the occipital lobes and the lingual and angular gyri. It is still uncertain whether or not callosal fibers pass into the internal capsule.

The function of the corpus callosum and the symptoms which result from its destruction have been subjects of discussion for many years. Little of importance was contributed to the subject until the brilliant studies of Liepmann revealed the association of ideomotor apraxia with lesions involving this structure. Liepmann's theory, in brief, is that



certain of the more complex volitional motor reactions, especially those which are acquired by training and experience, are dependent on the integrity of neural mechanisms which lie in the left<sup>1</sup> hemisphere in right-handed persons. The region of the angular and supramarginal gyri seems to be most important, for lesions in this region may render the subject completely apraxic. The influence of these structures is transmitted to the right hemisphere by the corpus callosum, and lesions in the corpus callosum may therefore deprive the right hemisphere of the influence of the praxic mechanisms in the left hemisphere and so render the patient apraxic on the left side.

Disorders involving the synthesis and interpretation of sensory impressions are termed agnosias and are regarded as comparable to the apraxias. Thus, one may consider alexia as visual agnosia (for signs) and word deafness as auditory (verbal) agnosia. Tactile agnosia is frequently but erroneously identified with astereognosis. In true agnosia there is no loss of sensibility, but the interpretation and understanding of sensory impressions are disturbed. Agnosia may be found on the side of the lesion or on the opposite side. A single lesion in the left hemisphere may cause bilateral agnosia. Astereognosis, on the other hand, in our experience is found always on the side opposite the lesion. We have never found it without some associated loss of sensibility, such as loss of two point sense, sense of tactile localization, sense of position or sense of passive movement; and we do not believe that astereognosis exists, in the usually accepted sense of the term. Campora and Kennedy have recently presented illuminating analyses of the nature of this sign. Both agree that it is due to loss of afferent impressions and that it is not a true agnosia. If we exclude astereognosis, true tactile agnosia does not seem to be well recognized. It is clear that the agnosias are associated with lesions in the posterior half of the hemisphere. Alexia is closely connected with lesions in the region of the angular gyrus. Meyer has emphasized the importance of lesions involving both the auditory radiation and the callosal fibers from the opposite temporal lobe in cases of word deafness, i. e., auditory agnosia without paraphasia. In general, however, the anatomic bases of the agnosias and of the apraxias are imperfectly established. It is not intended here to do more than indicate the general principles of the

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1. These statements are correct only when the speech and praxic mechanisms are situated, as they usually are, in the left hemisphere. In left-handed persons these mechanisms are found as a rule in the right hemisphere. In such cases, therefore, these statements must be corrected as regards right and left. It must be said in this connection that the dominant hand is not a reliable guide to the location of the speech mechanisms, for some left-handed persons have speech mechanisms on the left.

theories of aphasia and apraxia.<sup>2</sup> The reader is referred to the papers of Meyer and Bailey for a fuller discussion of these problems.

Most of the information which has been gained about the syndrome of the corpus callosum has been derived from the study of patients suffering from disease of the cerebral blood vessels. Numerous studies have been made of patients with neoplasm of the corpus callosum, but in these patients the condition is almost always complicated by symptoms of increased intracranial pressure, and it is rare to find a growth which does not infiltrate the cerebral hemispheres or at least involve them by direct pressure. The syndrome of the corpus callosum observed in cases of tumor of the brain, therefore, is composed chiefly of neighborhood signs, such as bilateral spasticity of the extremities, convulsive seizures and the signs and symptoms of increased intracranial pressure. In such cases apraxia is demonstrated in only about 10 per cent, probably because the examiner has failed to make the proper tests or because the patient's mental condition is such that it is impossible to carry out such tests. Experimental work on apes and other animals has not been helpful, because of the difficulties which arise in the attempt to correlate the findings in animals with those in man. It is known that in some cases the corpus callosum is congenitally absent, but the defect is usually merely part of a more extensive process, so that observations in such cases have thrown no light on the syndrome of the callosum. A degenerative process involving the corpus callosum is also described, but the same difficulty arises in these cases as in the cases of agenesis, for the lesions almost invariably invade the white matter of the hemispheres to some extent. We shall therefore confine the discussion to cases in which the corpus callosum has been injured as a result of vascular disease.

Study of the syndromes of the anterior cerebral artery has given the most substantial information about the symptoms which result from injury to the anterior part of the corpus callosum. This artery supplies the anterior seven eighths of the corpus callosum and the anterior, mesial and superior parts of the frontal lobe, including the paracentral

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2. In dealing with apraxia, just as with aphasia, one frequently finds that the conventional schemes are inadequate to explain the facts. The simple theories of localization are probably at fault. When one finds that alexia results from a lesion in the region of the angular gyrus, one is not justified in assuming that the faculty of reading resides in that small area of cortex. One knows merely that the function of reading may be destroyed by a lesion in this region or, as Dr. Meyer has phrased it, the function is most vulnerable at this point. No doubt such functions depend on the interaction of extensive neural mechanisms, and it is probable that the effective lesions are those which destroy essential links in these mechanisms. The underlying fiber tracts are possibly even more important than the special cortical areas.

lobule, where the motor reactions of the leg are represented. Occlusion of the anterior cerebral artery frequently results in softening of the anterior part of the corpus callosum, which causes motor apraxia of the left<sup>3</sup> arm, no matter whether the right or the left artery is involved. Thus, the apraxia may be on the side of or on the side opposite the lesion. Involvement of the paracentral lobule causes paralysis of the leg opposite the lesion. In some cases hemiplegia with crural predominance results, rather than monoplegia. If hemiplegia results and happens to be on the left side, the apraxia may be masked by the paralysis. The papers of Foix and Critchley should be consulted in this connection.

Much less information is available in regard to the syndromes of the posterior part of the corpus callosum. The splenium is supplied by the posterior cerebral artery, and Foix and Masson stated that the splenium is frequently softened when the posterior cerebral artery or some of its branches are occluded. Alexia is frequent when the left posterior cerebral artery is involved, but we have been unable to find any description of symptoms which can be attributed with confidence to involvement of the posterior part of the corpus callosum.

Almost all writers insist on the constancy of mental symptoms in cases in which the corpus callosum is injured. It is stated that the patient displays striking apathy, lack of spontaneous activity, inability to concentrate, and clouding of consciousness which may reach the degree of stupor. In cases of the more acute lesions disorientation for time, place and person, with confabulation and delirium, i.e., the so-called Korsakoff syndrome, is apparently characteristic. Such symptoms are described chiefly in cases of tumor of the corpus callosum and in cases of occlusion of the anterior cerebral artery, and it should be emphasized that the cerebral hemispheres are almost invariably affected to some extent. The relative importance of the lesions in the hemispheres and of those in the corpus callosum in the production of mental symptoms is not always clear.

In our patient the posterior half of the corpus callosum was cleanly sectioned during operation. There was no evidence to indicate that either hemisphere was injured. Hydrocephalus was present before the operation, but since the patient was subjected to many careful neurologic examinations during a period of more than a year, with entirely negative results, it is evident that the hydrocephalus caused no loss of function. The tumor was small and could have pressed directly on only the anterior part of the thalamus, so there was no possibility of direct injury to the cerebral hemispheres. At operation only one small vein was ligated, and the possibility of extensive damage to the brain

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3. The subordinate arm. See footnote 1.

by vascular obstruction seems remote. There was no pain, athetosis or other involuntary movement to suggest injury to the thalamus or lenticular nucleus. The right hemisphere was retracted during the operation, and since the symptoms were on the left, the possibility must be seriously considered that they may have been due to injury of the right occipital lobe or of its connections. The operator was certain, however, that the retraction was insufficient to cause any damage, for the operation was an exceptionally easy one. Moreover, the patient did not show the symptoms one would expect from trauma of the projection fields of the occipital or parietal lobe, since there was never any hemianopia or cortical anesthesia. We feel justified in assuming that the only important injury inflicted on the brain was the section of the corpus callosum. At least half this structure must have been cut to expose a tumor placed so far anteriorly. It is difficult to escape the conclusion, therefore, that the postoperative symptoms were direct results of the injury to the corpus callosum.

On the other hand, Dr. Dandy stated that the corpus callosum may be sectioned without ill effects. In a recent paper dealing with pineal tumors he wrote:

The corpus callosum is split longitudinally from its posterior extremity to a point anteriorly where the third or lateral ventricle comes into view; this incision is bloodless. Usually this incision takes most and sometimes all of this structure to its downward bend. No symptoms follow its division. This simple experiment at once disposes of the extravagant claims to function of the corpus callosum.

Such a statement cannot be lightly disregarded. Evidently the symptoms we describe are not apparent after the pineal operation in all cases. A number of possible explanations may be offered. The patient's mental condition is in many cases so much affected that proper examinations are impossible. In other cases the significant symptoms are masked by paralysis, loss of vision or other gross neurologic disorders. Special methods of examination are required to demonstrate the essential symptoms. A pineal tumor lies posteriorly and hence does not require such extensive section of the callosum as a tumor lying anteriorly, as did the one reported here. Evidently it is unusual to have such an ideal opportunity to study the effects of callosal section as we had in our case.

The patient's inability to recognize letters or other objects in the left visual fields without any change in the outlines of the form or color fields whatever may be attributed to destruction of fibers connecting the region of the left angular gyrus and adjacent speech areas with the right occipital lobe. Since a lesion in the region of the left angular gyrus will cause total alexia, a lesion which deprives the right hemisphere of the influence of this area may be expected to cause alexia

on the left. Such a lesion is not necessarily in the corpus callosum, for it may involve the commissural fibers which pass through the callosum in either the right or the left hemisphere. One of us has observed several cases of alexia on the left in elderly patients having a vascular lesion in the distribution of the posterior cerebral artery but has not had an opportunity to determine the exact site of the lesions by postmortem examination.

In the same way it is probable that the patient's inability to recognize small wooden letters placed in the left hand is due to deprivation of the right hemisphere of gnostic influences of structures lying in the left hemisphere, possibly in the parietal cortex. It must be emphasized that the patient did not show any loss of two point sense, of tactile localization, of appreciation of differences of weight, of sense of passive movement or of sense of position, which one expects in cases of lesion of the postcentral convolution. Moreover, the patient could recognize familiar objects, such as a key, a pencil, a spoon, a comb and hairbrush, with ease. The defect was limited to inability to recognize letters of the alphabet and was absolute in this regard. Her disability was therefore a very selective type of tactile agnosia, related to the speech functions and directly comparable to alexia.

The loss of memory of topography involves a complex series of functions. Our observations indicate that this symptom may be produced by a lesion confined to the posterior half of the corpus callosum. No doubt such a lesion destroys numerous pathways connecting neural mechanisms lying in the posterior halves of the hemispheres which serve to synthesize and to retain visual impressions. Concepts of spatial relations not only are dependent on the synthesis of visual impressions but are influenced by proprioceptive sensations of the extra-ocular muscles, the labyrinths and the muscles of the neck. No doubt widespread neural mechanisms take part in these processes. Previous observations have shown that loss of memory of topography and spatial disorientation may be caused by bilateral lesions in the posterior portions of the cerebral hemispheres. Gordon Holmes and Horrax have studied several patients with a gunshot wound of the brain. In one case in which the bullet had passed through the brain almost horizontally, involving the angular gyrus on both sides, they found the following symptoms: (1) inability to orientate accurately in space objects perceived in either visual field; (2) inability to distinguish and compare length and size of objects seen; (3) loss of stereoscopic vision; (4) loss of visual attention in both visual fields; (5) failure to fix objects lying in the peripheral fields and inability to follow moving objects with the eyes, and (6) loss of topographic memory, so that the patient could never learn to find his way around, even in familiar localities, could not draw



simple diagrams and maps, etc. Holmes and Horrax mentioned several other cases in which a penetrating wound of the brain involving both angular gyri or a bilateral vascular lesion in the same region caused the same symptom complex. It seems clear, therefore, that a bilateral lesion in the region of the angular gyri will give rise to such symptoms. Marie and Béhague have described spatial disorientation due to a deep wound of the frontal lobe. In their cases there were also intellectual torpor, slowness of action and expression and marked irritability. The lesions were unilateral, and it seemed to be immaterial whether the left or the right frontal lobe was injured. It is difficult to know how to interpret these observations, but numerous careful studies of the effects of frontal lobectomy for tumor of the brain make it clear that spatial disorientation is not a characteristic symptom of lesion of the frontal lobe. It is possible that the spatial disorientation observed by Marie and Béhague was merely a manifestation of a general state of mental confusion and not of the same nature as that described by Gordon Holmes.

#### SUMMARY

A case of colloid cyst of the third ventricle is reported, and the symptoms caused by such a cyst are analyzed. The cyst was removed by the posterior approach, and the posterior half or more of the corpus callosum was sectioned during the operation. Reasons are given to support our belief that section of the corpus callosum was the only significant injury inflicted on the brain. After operation the patient showed the following symptoms: (1) complete disorientation for time, place and person, with confabulation and euphoria for several weeks after operation but thereafter no mental symptoms whatsoever; (2) inability to form and retain topographic memories, so that she frequently would become lost in her own home; (3) inability to recognize letters of the alphabet (by touch) in the left hand without astereognosis or evidence of cortical anesthesia, and (4) inability to recognize letters falling in the left visual field, with loss of visual attention on that side but without hemianopia for form or color. Symptoms 2, 3 and 4 have persisted up to the present, during a period of four years, although they have become less severe year by year. An attempt is made to show that symptoms 3 and 4 are not due to loss of sensibility but are true agnosias.

These observations suggest that a lesion of the posterior part of the corpus callosum causes alexia on the left <sup>4</sup> and tactile agnosia for letters in the left <sup>4</sup> hand, just as a lesion of the anterior part of the corpus callosum causes motor apraxia of the left <sup>4</sup> arm. It is suggested that

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4. The subordinate arm. See footnote 1.

the symptoms described constitute the syndrome of the posterior part of the corpus callosum. It must be admitted, however, that conclusions drawn from one case cannot be regarded as established, and the true significance of the symptoms noted in our case and their actual relation to section of the corpus callosum cannot be determined until additional studies are made in similar cases.

Drs. Barker, Sprunt and Dandy gave permission for the publication of a report of this case. The neurosurgical aspects in this case have been reported by Dr. Dandy.

## BIBLIOGRAPHY

- Alpers, B. J., and Grant, F. C.: The Clinical Syndrome of the Corpus Callosum, *Arch. Neurol. & Psychiat.* **25**:67 (Jan.) 1931.
- Bailey, P.: A Contribution to the Study of Aphasia and Apraxia, *Arch. Neurol. & Psychiat.* **11**:501 (May) 1924.
- Campora, G.: Astereognosis: Its Causes and Mechanism, *Brain* **48**:65, 1925.
- Critchley, McD.: The Anterior Cerebral Artery and Its Syndromes, *Brain* **53**:120, 1930.
- Dandy, W. E.: Benign Tumors in the Third Ventricle of the Brain, Springfield, Ill., Charles C. Thomas, Publisher, 1933.
- Operative Experience in Cases of Pineal Tumors, *Arch. Surg.* **33**:19 (July) 1936.
- Davidoff, L. M., and Dyke, C. M.: Congenital Tumors of the Rostral Portion of the Third Ventricle, *Bull. Neurol. Inst. New York* **4**:221, 1935.
- Foix, C., and Hillemand, P.: Les syndromes de l'artère cérébrale antérieure, *Encéphale* **20**:209, 1925.
- and Masson, A.: Le syndrome de l'artère cérébrale postérieure, *Presse méd.* **31**:361, 1923.
- Holmes, G., and Horrax, G.: Disturbances of Spatial Orientation and Visual Attention with Loss of Stereoscopic Vision, *Arch. Neurol. & Psychiat.* **1**:385 (April) 1919.
- Ironside, R., and Guttmacher, M.: The Corpus Callosum and Its Tumors, *Brain* **52**:442, 1929.
- Kennedy, F.: Astereognosis, *Arch. Neurol. & Psychiat.* **12**:305 (Sept.) 1924.
- King, L. S., and Meehan, M. C.: Primary Degeneration of the Corpus Callosum, *Arch. Neurol. & Psychiat.* **36**:547 (Sept.) 1936.
- McLean, A. J.: Paraphysial Cysts, *Arch. Neurol. & Psychiat.* **36**:485 (Sept.) 1936.
- Marie, P., and Béhague, P.: Syndrome de désorientation dans l'espace consécutif aux plaies profondes du lobe frontale, *Rev. neurol.* **26**:3, 1919.
- Meyer, Adolf: The Present Status of Aphasia and Apraxia, in *Harvey Lectures, 1909-1910*, Philadelphia, J. B. Lippincott Company, 1910, p. 228.
- Riddoch, G.: Progressive Dementia Without Headache or Change in the Discs Due to Tumours of the Third Ventricle, *Brain* **59**:225, 1936.
- Zimmerman, H. M., and German, W. J.: Colloid Tumors of the Third Ventricle, *Arch. Neurol. & Psychiat.* **30**:309 (Aug.) 1933.

## THE CATATHYMIC CRISIS

A CLINICAL ENTITY

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In the field of the psychiatry of crime the psychiatrist is confronted with a phenomenon for which he is little prepared by general psychopathology. The person to be examined has committed one or several overt acts. Usually the nature of these acts is familiar. One knows a great deal about their content, their meaning and their motivation from experience with patients who express a similar content in their fantasies, dreams and various symptoms. But however much one may know about fantasies that are, for instance, cruel and sadistic, it is a long step from this knowledge to the understanding of such a case as that of a girl, not psychotic or mentally deficient, who because of jealousy deliberately pours lysol on the eyes of a sleeping girl who has been her friend and blinds her. Even if one grants that thought is just another form of activity, the problem remains why in an individual case this implicit activity of thought should be translated into explicit action. A large part of the psychiatry of crime therefore resolves itself into the psychopathology of overt acts.

In forensic procedure the psychiatrist as a rule is placed in a position in which the primary task assigned to him is to determine whether a person is "sane or insane." He finds himself facing legal definitions which not only lack a truly social point of view but are scientifically dubious. He is asked to make dogmatic statements about "irresistible drives" when it must be admitted that with regard to overt acts psychopathology still tells little about resistible drives. Or he has to pronounce on the "nature and quality of the act" when he knows that different acts have very different meanings with respect to the controlling forces of the personality. He is asked to use a formalistic definition of the "knowledge of right and wrong," which is handled by the legal mind with a rigidity reminding one of the morbid attitudes of many neurotic patients.

The determination of legal responsibility, however, is only a part of this branch of social psychiatry. The psychiatrist must be interested in more realistic diagnoses in these cases; he must attempt to come nearer to the definition of the real limits of individual responsibility

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From the Mental Hygiene Clinic, the Bellevue Hospital.

and sociologic determinants; he must attempt to bring the knowledge of psychotherapy to bear even on persons who are considered as responsible criminals and are measured by the law with the simple yardstick of years in jail or on probation.

Psychiatry has so far approached these problems by two methods. It has attempted, first, to determine the clinical diagnosis in these cases quite independently of the criminal act which has been committed, assigning to the criminal act no rôle other than that of a single symptom in a whole clinical picture. Second, it has attempted to use, in its search for psychologic motives behind crimes, the same psychologic methods which are applied to the analysis of neurotic symptoms. In the study of delinquents who have committed serious crimes the application of both these methods meets great difficulties. Comparatively few criminals suffer from clinically well defined mental disorders. In making a diagnosis one finds oneself embarked on the ill charted sea of "psychopathic personalities," "neurotic characters" or "personality types." To regard every case as a problem in itself may be desirable, but it cannot satisfy either the legal or the scientific psychiatric mind. The analysis of motives and hidden factors in personality development is hampered in practice by the fact that one rarely sees the major criminals, especially those who would be most instructive, under suitable circumstances.

After having occupied myself with these questions for some time, it is my impression that general psychopathology can be greatly advanced by a careful study of persons who have committed violent crimes. Psychiatry can ill afford to neglect the study of this enormous material for the progress and clarification of its own problems. My purpose in this paper is to draw attention to a typical sequence of events that I have found in a number of cases in which a person has committed or attempted a violent act either against others or against himself.

The conception of catathymic behavior was introduced by Maier.<sup>1</sup> As is often the case with psychopathologic terms, "catathymic" has been given different meanings by different authors. However, these differences are not important. A catathymic reaction is the transformation of the stream of thought as the result of certain complexes of ideas that are charged with a strong affect—usually a wish, a fear or an ambivalent striving. Catathymic symptom formation is caused by one latent idea, in contrast to the effect resulting from a general abnor-

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1. Maier, Hans W.: Ueber katathyme Wahnbildung und Paranoia, *Ztschr. f. d. ges. Neurol. u. Psychiat.* **13**:555, 1912; Ueber einige Arten der psychogenen Mechanismen, *ibid.* **82**:193, 1923.

mal mood setting. It consists in a rutlike fixation on one topic and is always accompanied by marked egocentricity. The predisposition to this catathymic thinking exists whenever the balance between logic and affectivity is disturbed. Distinction must be made between catathymic symptom formation and what Wernicke called an *überwertige Idee*, for it applies not only to paranoid thinking but to all sorts of abnormal phenomena, such as delusions, hallucinations and dreamy states.

Outside of the development of paranoic and paranoid delusions, little attention has been given to the study of catathymic symptom formation. I have observed in a number of cases a form of catathymic reaction characterized primarily by one feature: The patient acquires the idea that he must carry out a violent act against others or against himself. This idea does not arise in an obsessive form. It appears as a definite plan, accompanied by a tremendous urge to carry it out. The plan itself meets such resistance in the mind of the patient that he is likely to hesitate and delay. The violent act usually has some symbolic significance over and above its obvious meaning. There are no definite projections, although the thinking of the patient may have an almost delusional character in its rigidity and inaccessibility to logical reasoning.

The clinical development usually is as follows: A traumatic psychogenic experience precipitates an unbearable and seemingly unsolvable inner situation leading to extreme emotional tension; the subject holds the outer situation entirely responsible for this inner tension; his thinking becomes more and more egocentric; with apparent suddenness a crystallization point is reached in the idea that a violent act against another or against himself is the only way out. After a prolonged inner struggle this violent act is carried out or is attempted. It is followed immediately by an almost complete removal of the preceding emotional tension, but the patient does not gain insight at this time. There follows a superficially normal period of varying length, usually several months, after which an inner equilibrium is reestablished, which leads to insight. It then becomes clear to the patient that the outer situation with which he was faced after the initial traumatic experience does not sufficiently account for the violent act committed, even though he may not realize that it satisfied a deep inner need of which he is not aware.

The proof that this sequence of events, for which I propose the term catathymic crisis, constitutes a clinical entity can come only from the exclusion of all other mental conditions that have to be considered in differential diagnosis. Such inadequately motivated and seemingly



impulsive acts of violence occur sometimes on a schizophrenic basis. Moreover, it happens not infrequently that in psychotic patients such an act, or an attempt at it, precedes improvement, or even recovery. Jameison expressed this clearly in a recent study of suicide:<sup>2</sup>

There is the common observation that certain patients after failure [an unsuccessful attempt] to commit suicide abruptly become much better mentally. The depression seems to lift; they are cheerful and agreeable, and temporarily (occasionally permanently) all the various fears and tension disappear.

I should speak of this phenomenon as a catathymic crisis occurring as a syndrome in association with a mental disorder.

My material includes various types of violent acts which were committed or definitely attempted: murder, setting fire to a crowded tenement house, self-castration, blinding and self-blinding, infanticide and suicide.

Brief accounts of cases would be inadequate to demonstrate the existence of the catathymic crisis as a clinical entity without any admixtures of other mental disorders. I shall refer therefore to a monograph to be published later, giving a detailed account of a case of murder in which the subsequent history of several years confirmed the diagnosis.

The clinical position of the catathymic crisis may be visualized as lying within a triangle the outer points of which are a neurosis, a crisis in personality development and a psychosis. Usually these crises go by such diagnoses as psychopathic personality, schizophrenia and "compulsive states." Predisposition apparently exists in persons who are disposed to catathymic thinking. It will be the object of further study to determine the relationship of the catathymic crisis to personality types, typical life situations and psychogenic mechanisms in general.

Practically, the conception of the catathymic crisis as a clinical entity seems indispensable for the understanding of certain forms of violent crime and of suicide. Theoretically, it leads to interesting side-lights on general psychopathology. The period following the crime, for example, has a superficial appearance of normality. But it can be demonstrated that during this time a profound inner adjustment is taking place which finally leads to a complete shift in the person's attitude and results in the gain of insight and the reestablishment of an equilibrium which is lasting. In other words, during this period a definitely psychologic process takes place, much like the "disease process" of unknown nature that one assumes in attack psychoses, such as manic-depressive psychosis.

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2. Jameison, G. R.: Suicide and Mental Disease: A Clinical Study of One Hundred Cases, *Arch. Neurol. & Psychiat.* **36**:1 (July) 1936.

It is interesting also that, regarded from the point of view of the development of the personality, the violent act seems to constitute a benign feature. It is an expression of the fight on the part of the patient for the safeguarding of his personality. One gains the impression that the violent act in these cases prevents developments that would be far more serious for the patient's mental health. The overt act seems to become a rallying point for the constructive forces of the personality, which is otherwise in danger of chronic neurotic developments and even of progressive estrangement from reality. The study of catathymic crises, therefore, assumes a fundamental significance in the still problematic psychopathology of overt acts.

## Editorial Note

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An article entitled "Clinical Studies in Dementia Paralytica," by Phyllis Greenacre, M.D., belongs with the series of contributions published in this number dedicated to Dr. Adolf Meyer and will appear in a later issue of the ARCHIVES.

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## News and Comment

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### THOMAS WILLIAM SALMON MEMORIAL LECTURES

The fifth series of the Thomas William Salmon Memorial Lectures will be given by Dr. William Healy, Director, the Judge Baker Guidance Center, Boston, on Friday evenings, April 9, 16 and 23, 1937, at 8:30 p. m., at the New York Academy of Medicine, 2 East One Hundred and Third Street, New York. The topic of the lectures is: "Personality—Foundations, Development and Widening Human Relationships."

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### CORRECTION

In the article by Dr. Jules H. Masserman, entitled, "Effects of Sodium Amytal and Other Drugs on the Reactivity of the Hypothalamus of the Cat," which appeared in the March issue (37:617, 1937), an omission occurred in the last footnote in the article, on page 628, "Bradford" having been omitted after Dr. F. Keith; in other words, the name should read Dr. F. Keith Bradford.

## Book Reviews

**Studies in Infant Speech and Thought: Part I. The Development of Sentence Structure in Infancy from the Viewpoint of Grammar.** By Abraham A. Low. Illinois Medical and Dental Monographs, Vol. 1, No. 2. Price, \$1. Pp. 71. Urbana, Ill.: University of Illinois Press, 1936.

Dr. Low became interested in the development of language in the young child through his studies of the disintegration of language functions in aphasia. He found that the existing work on language development emphasized the size of the vocabulary, the first appearance of various forms of speech, or the length of sentences but had little to say of the integration of grammatical structure. He therefore planned a study of this problem and developed a method for the quantitative analysis of progress in the acquisition of grammatical forms.

The method was tested on two children, a boy of 1 year and 2 months at the beginning of the study and another boy of 2 years and 8 months. The mothers of these children each kept verbatim records of speech for more than two years. Similarities and differences between the two children are brought out by comparing the records at functionally equivalent points, that is, points at an equivalent number of months from the ages at which the children showed final mastery of sentence structure. This method showed clear differences between the two children in the course of grammatical development: The child who was the first to use most grammatical forms, or at least to attain a partial mastery of them, in most instances required a longer period for complete mastery.

The emphasis throughout the report is on the mastery of sentence structure, and there are few references to the nature of the errors which appear in the course of achieving the accepted forms. From the point of view of the development of language functions in relation to the disintegration of language, particularly as it appears in receptive or sensory aphasia, further records of the errors are important.

The report as it stands, however, offers valuable clues to the student of language disorders and is a significant contribution to the literature on the development of language. It is to be hoped that the method demonstrated for these two children will, as the author suggests, be applied more widely.

**Syndrome of the Craniospinal Tumor: Symptomatology, Pathology and Treatment.** By D. K. Bogorodinski, Clinic of Nervous Diseases, the Molotov Tashkend Medical Institute. State edition, U. S. S. R. Paper. Price, 2 rubles and 60 kopecks. Pp. 103, Tashkend, Turkestan: U. S. S. R., 1936.

Extraspinal tumors situated in the foramen occipitale magnum and extending cephalad into the posterior cranial fossa and caudad into the vertebral canal possess, according to Bogorodinski, a sufficiently suggestive clinical picture to justify one in speaking of a special syndrome. For this syndrome Bogorodinski offers the name "craniospinal." Though situated in close proximity both to the medulla and to the cerebellum, craniospinal tumors give no striking, if any, bulbar or cerebellar symptomatology. The syndrome in general varies greatly, depending on the size of the tumor, its relationship to the cranial nerves or spinal cord, the stage of the disease process and other factors. Craniospinal tumors may cause pain (neuralgic stage) and paralysis (hemiplegia, paraplegia, tetraplegia and mixed forms), with or without involvement of cranial nerves or disturbances of sensibility, which on the whole are in marked disproportion to the extent of the motor disturbances. The problem is discussed by Bogorodinski from all possible angles, on the basis of a case of his own and a careful study of twenty-two cases collected from the literature. The subject is unquestionably of importance, as the clinical picture (pain and rigidity of the neck, with paralysis of the cervical muscles and extremities) is sometimes not typical and may resemble incurable conditions, such

as amyotrophic lateral sclerosis or multiple sclerosis. The patient thus may fail to obtain the benefit of surgical intervention, which in many cases (50 per cent) relieved an apparently hopeless condition, since the tumors are mostly operable (meningiomas).

This monograph from the transcasian Asiatic regions of the Soviet Union is a laborious and conscientious contribution to knowledge of localization of tumors of the spinal cord. It contains a complete bibliography, in which American contributions are well represented, and it also has a fair synopsis in English. Unfortunately, the print, paper and pictures are poor.

**The Thyroid: Surgery—Syndromes—Treatment.** By E. P. Sloan, M.D. Edited by members of the Sloan Clinic, and with a foreword by William Seaman Bainbridge, M.D. Cloth. Price, \$10. Pp. 475, with 99 illustrations. Springfield, Ill.: Charles C. Thomas, Publisher, 1936.

This volume records the working theories and conclusions of a surgeon who devoted twenty-five years exclusively to goiter work and founded the Sloan Clinic of Bloomington, Ill. The book was not completed at the time of Dr. Sloan's death, in 1935, and is edited by his associates. The work is divided into twenty chapters, dealing with the conventional topics of anatomy, physiology, etiology, pathology, symptoms, diagnosis and treatment. There is a lengthy discussion of historical material and a résumé of recent contributions to the subject of hypothyroidism. Original illustrations by William B. McVett and a bibliography of two hundred and fifty-four references add to the value of the book.

Dr. Sloan's conception of thyroid disease is broader than that of most surgeons. He regards exophthalmic goiter as a constitutional disorder and makes provision for its medical treatment. He places great emphasis on prophylaxis, believing that "the entire problem of the mental and physical development of the youth of our land is unequivocally bound up with the management of the goiter problem." He acknowledges the need for cooperation between surgeon, internist, public health officials and psychiatrist. His theories of thyroid disease leave little room for the psychiatrist, however; that emotional stress, even fright, may be the precipitating cause of exophthalmic goiter is a possibility he dismisses, stating that the disease was already present in mild form. His observations of mental symptoms are limited and are described without a knowledge of even classificatory psychiatry. Some measure of his understanding of the personal aspects of exophthalmic goiter is to be found in the statement under the heading of "Vagaries," that "they (patients) travel from physician to physician, develop unfounded antipathies for a certain physician and refuse to go back to him."

The volume is useful as a compendium on the thyroid gland but contains little of special interest to the psychiatrist.

**Trigeminus Neuralgie: Een Anatomische en Klinische Studie (Trigeminal Neuralgia: An Anatomic and Clinical Study).** By Y van der Wielen. Paper. Price, \$???. Pp. 180, with illustrations. Amsterdam, the Netherlands: D. B. Centen's Uitgevers-Maatschappij N. V., 1936.

This monograph, emanating from Brouwer's clinic, is chiefly remarkable for a careful and well illustrated histologic study of the brain stem of a patient who died long enough after bilateral section of the trigeminal roots to permit degeneration to occur. To quote from the author's summary: "The motor nucleus was well formed on both sides; the number of cells was less as compared with that in normal persons. The cells of the main sensory nucleus were intact. The mesencephalic nucleus, both on the right and on the left, presented no changes. The mesencephalic tract on both sides showed a slight loss of thickness. The locus cœruleus was entirely intact on both sides. The mesencephalic tract must be autonomic. The locus cœruleus does not belong to the trigeminal system. The whole spinal tract was degenerated bilaterally."



In addition to this detailed study, there are a good history and an abstract of other anatomic investigations. A series of one hundred and two cases from the Amsterdam clinic is reported in detail. In many of these subtotal resection of the root was carried out, and the actual area of loss of sensation which resulted is illustrated for each of them. As a result of his clinical studies the author believes that there is an unpredictable mingling of fibers in the posterior root. To insure anesthesia of the third division, he recommends intracranial section of the maxillary branch as well as subtotal section of the root. He found deep sensation preserved in all his cases.

**Psychotherapie: Ein Lehrbuch für Studierende und Ärzte.** By H. Kogerer. Price, 10 marks. Pp. 167. Vienna: Wilhelm Maudrich, 1934.

This textbook is designed for students and practitioners, as a guide for treatment of the neuroses. It contains a brief account of the writings of Freud, Adler, Jung and other modern psychologists. Freud's work receives the most space and, on the whole accurate reporting, but rather scant praise. The method of making suggestion and hypnosis is outlined. The more important neuroses and psychoses, are described, with illustrative cases. This work is on the whole, rather colorless, with little new material except the reports of cases. For this reason it might appeal to beginners in psychiatry, but it lacks the reality and convincingness of Bernard Hart's little book of Freud's introductory lectures or of clear, objective descriptions.

**Symbolik des Hirnhaus—Erscheinungswissenschaftliche Untersuchungen über den Bau und die Funktionen des Zentralnervensystems der Wirbeltiere und des Menschen.** By Dr. F. S. Rothschild. Paper. Price, 24 marks. Pp. 357, with 35 illustrations. Berlin, S. Karger, 1935.

This book is an interesting attempt, venturing beyond the realm of anatomic, physiologic and clinical knowledge. The author's aim is to correlate the cut and dry facts of anatomy with the intricacies of psychologic detail and even with such specialized psychologic thought, sometimes bordering on metaphysics and mysticism, as that of Klages. One should not be surprised, therefore, that Rothschild in many instances deviates into the undetermined and even into fantasy, especially in his discussion of the significance of transversal and sagittal convolutions. Still, he succeeds in pointing out and discussing in a stimulating way certain interesting gaps in knowledge of psychosomatic relationships; for instance, lack of satisfactory explanation for the functional predominance of one hemisphere over the other in man, in spite of their symmetrical structure. Rothschild's explanation (identification of the ego with one hemisphere) does not appear to be more satisfactory than any given previously. The value of the book will be measured by the amount of factual research it may stimulate.